A QUASI EXPERIMENTAL STUDY TO EVALUATE THE EFFECTIVENESS OF ROASTED FENUGREEK SEED POWDER ON BLOOD GLUCOSE AMONG CLIENTS WITH TYPE II DIABETES MELLITUS IN URBAN COMMUNITY HEALTH CENTRE AT KAMARAJAPURAM, PUDUKKOTTAI

By

A. PRIYADHARSHINI

A DISSERTATION SUBMITTED TO THE TAMILNADU Dr. M.G.R. MEDICAL UNIVERSITY,CHENNAI IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE DEGREE OF MASTER OF SCIENCE IN NURSING

OCTOBER 2015

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CERTIFICATE

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A DISSERTATION SUBMITTED TO THE TAMILNADU Dr.M.G.R.MEDICAL UNIVERSITY, CHENNAI IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE DEGREE OF MASTER OF SCIENCE IN NURSING

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CERTIFIED THAT THIS IS A BONAFIDE WORK OF

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TO WHOMEVER IT MAY CONCERN

This is to certify that the Ethical committee of Karpaga Vinayaga College of Nursing, Pudukkottai has discussed with its members the topic **"A QUASI EXPERIMENTAL STUDY TO EVALUATE THE EFFECTIVENESS OF ROASTED FENUGREEK SEED POWDER ON BLOOD GLUCOSE AMONG CLIENTS WITH TYPE II DIABETES MELLITUS IN URBAN COMMUNITY HEALTH CENTRE AT KAMARAJAPURAM, PUDUKKOTTAI"** during the year 2014-2015 adopted by **Ms. A. PRIYADHARSHINI** and its implications on study subjects for her thesis for M.sc Nursing programme and the committee passed clearance for the same topic for her to pursue.

ETHICAL COMMITTEE

ACKNOWLEDGEMENT

“Hard Work Never Fails”

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ABSTRACT

Diabetes Mellitus (DM) or simply diabetes is a group of metabolic diseases in which a person has high blood sugar. Diabetes is due to either the pancreas not producing enough insulin, or because cells of the body do not respond properly to the insulin that is produced. Fenugreek may hold a special interest by people who suffer from diabetes. Due to the high content of soluble fiber, it has long been assumed that the benefit of fenugreek seeds for diabetes lies with its ability to modulate plasma glucose levels by delaying gastric emptying and by direct interference with glucose absorption.

OBJECTIVES:

To assess the pre test level of fasting blood glucose among clients with type II diabetes mellitus in experimental group and control group.

To assess the post test level of fasting blood glucose among clients with type II diabetes mellitus in experimental group and control group

To evaluate the effectiveness of roasted fenugreek seed powder on level of fasting blood glucose among clients with type II diabetes mellitus in the experimental group.

To find out the association between the post test level of fasting blood glucose with their selected demographic variables in experimental group.

Conceptual framework	:	J. M. Kenny's Open System Model
Research design	:	Quasi Experimental, Non Randomized control group Design (pre test post test control group design)

Group Design :

Type II diabetes mellitus	**Pre test**	**intervention**	**Post test**
Experimental	O1	X	O2
Control	O1	-	O2

Population	:	clients with type II diabetes mellitus, aged between 31-60 years
Sample size	:	70 type II diabetes mellitus clients, 35 in experimental group and 35 in control group
Sampling	:	Non Probability- Purposive Sampling technique
Setting	:	Urban Community Health Centre, Pudukkottai
Tool	:	Demographic variable and clinical variable
Data collection	:	Quasi experimental, Non randomized control group [pre test post test control group]design was used. The timing of data collection was 6 weeks. Roasted Fenugreek seed powder was given to type II diabetes mellitus clients for 28 days. The level of fasting blood glucose was assessed by glucometer (Accu check).
Data analysis	:	Descriptive Statistics (Frequency, Percentage, Mean, and Standard deviation) and inferential statistics (Paired 't' test, unpaired 't' test and chi-square) were used to test the research hypotheses.

MAJOR FINDINGS OF THE STUDY

1. Experimental group type II diabetes mellitus clients had experienced mild and moderate level of blood glucose, when compared with control group.
2. There was a significant difference in the level of fasting blood glucose between control and experimental group. So that the administration of roasted fenugreek seed powder helps to reduce the level of blood glucose among clients with type II diabetes mellitus.
3. There was a significant association between the level of fasting blood glucose with selected demographic variables in experimental group

CONCLUSION

1. Fenugreek seed improves glycemic control and decreases insulin resistance in type II diabetes mellitus clients.
2. There is also a favourable in reducing their economic burden.

CHAPTER-I
INTRODUCTION

BACKGROUND OF THE STUDY:

"Prevent diabetes to protect our future".

- WHO (2O13)

Diabetes mellitus (DM) or simply diabetes is a group of metabolic diseases in which a person has high blood sugar. Diabetes is due to either the pancreas not producing enough insulin, or because cells of the body do not respond properly to the insulin that is produced, (Brunner & Suddharth, (2012).

The term diabetes is derived from a Greek word diabetes which means to go through or a siphon and the word mellitus is derived from a Latin word ME (honey) describes the sweet odour of the urine. Diabetes mellitus is a silent disease and now recognized as one of the fastest growing threat to public health in almost all countries of the world. It is also called the disease of prosperities .prevention is better than cure and is less expensive.

George P. Kozak (2014) Type II diabetes mellitus is characterized by insulin resistance, which may be combined relatively reduced insulin secretion. Insulin is believed to involve the insulin receptor.

Around 150 million people suffered from diabetes in the world, out of that above 35 million are the Indians the highest in the world, so it is called "diabetic capital of the world". Every fifth person who suffers from diabetes in the world today is an Indian.

Globally, as of 2013, an detected 382 million people had diabetes worldwide, with type II diabetes making up about 90% of the cases in both women and men and it is the 8th leading cause of death by 2035.

In 2011 diabetes resulted in 1.4 million deaths worldwide, making it the number of people with diabetes is expected to rise to 592 million by the world is moving towards nature.

By 2030 Indian will have 79.4 million diabetic projects of WHO (WORLD HEALTH ORGANISATION) that's more than twice the current number over 35 million cases. "No wonder" India is the "DIABETIC CAPITAL OF THE WORLD".

Harris R, Rees R , (2000) Diabetes claims four million lives every year. Long standing, inadequately managed or untreated case of diabetes leads to complication which causes blindness, end stage renal disease, stroke, ischemic heart disease, peripheral vascular disease, peripheral neuropathy, lower extremity amputations due to involvement of foot.

Madras Diabetes Research Foundation summarized the situation as follows "diabetes [in India] is no longer a disease of the affluent or a rich man's disease, it is becoming a problem even among the middle income and poorer sections of the society".

SIGNIFICANCE AND NEED FOR THE STUDY:

Diabetes is an "Ice Berg" disease. According to recent estimates Prevalence of Diabetes Mellitus in adults was around 4% worldwide and it means that over 143 million persons are newly affected.[6] The population in India has an increase in adults was found to be 2.47 in rural and 4.0-11.6 in urban dwellers. High frequencies of impaired glucose tolerance shown by studies ranging form 3.6 to 9.17 indicates the potential for further rise in prevalence of diabetes mellitus in the coming decades. It is projected that the disease prevalence will be 5.4% by the year 2025, with Global diabetic population reaching 300 million, of this close to 77% of the Global burden of disease was projected to occur in the developing countries. The important differences are observed in the age structure of diabetic population between developed and

developing countries. Whereas, in the developed country, the majority of diabetics are ages 65 years and above, it was 45 to 64 years in the developing country. An estimated 30 million persons in the South-East Asian region are affected at present.

It is estimated that by the year 2025 there will be nearly 30 million diabetics in the region. The prevalence of Diabetes Mellitus in countries of the South – East Asia region ranges between 2.1% - 4% from this 1% in adult populations. In major urban agglomerates, the prevalence was shown to be much higher: 6 to 12%.

S. S. Prabhudeva (2009). India, the world's second most populous country, has now more people with type II diabetes (more than 50 million) than any other nation. India as "Diabetic Capital" holds the age related prevalence of 8% in 2010. Diabetic spending of India is US $ 2.8 billion or 1% of the global total health care expenditure. In lower middle incomes, people with diabetes must pay for their care out of their own packet because public medical service and insurance are lacking. The diagnosis of diabetes in a low or middle- income country can often drag entire families into poverty.

Currently the number of diabetic cases worldwide is estimated to be around 150 million. In 2000, India topped the list with 31 million diabetics. China had 21 million and America had 17 million. India and America will have 79 million diabetics by 2030, but it was an understatement. Facts falsified these estimates. As revealed by facts about diabetes, in 2007, the number of diabetics in the US was 23.6 million. The figure predicted was just 30 million by 2030. With only seven years gone, it has reached 23.6 and gone up by 39%.It is ironical that in spite of spending trillions of dollars in allopathic medical research on diabetes, American healthcare systems have not been able to control diabetes; on the contrary incidence of diabetes has increased. If this trend continues until 2030, America will reach 33 million by 2014 and by 2030, it will be around 70 million. These facts about diabetes confirm that USA has beaten the WHO estimates by 133%. If the same trend continues in India, this country will

have 184 million diabetics in 2030 whereas WHO estimated it as 79 million. The true facts about diabetes are staggering indeed.

The worldwide prevalence of type II diabetes mellitus is growing rapidly, reaching epidemic proportions. The prevalence of diabetes in India is currently around 13% to 15%. Cardio vascular disease is the leading cause of death in patients with diabetes mellitus. Attempts to be made to improve this statistics tend to focus primarily on the prevention of Coronary artery disease.

Mohan (2006) reported in his longitudinal population based study regarding incidence of Diabetes mellitus in selected urban south Indian population had incidence rate of Diabetes mellitus was 20-22 per 1000 persons per year.

David John (2009) Prevalence of type II diabetes is increasing globally, more so in developing countries like Tamil Nadu due to rapid urbanization. It is estimated that prevalence of diabetes will rise to 5.5% in 2025 as compared to 4% in year 1995. The total direct cost for diabetes management has doubled from 1998 to 2005. Therefore, prevention is important both on monetary and human matters. There is an increasing amount of evidence that dietary supplements are the most effective way to lessen diabetes and its management.

Ralpha A. De Franzo (1988) Diabetes Education and prevention is the World Diabetes Day theme for the period 2009 to 2013. The campaign calls on all those responsible for diabetes care to understand diabetes and take control. For people with diabetes, this is a message about empowerment through education. For governments, it is a call to implement effective strategies and policies for the prevention and management of diabetes in order to safeguard the health of their citizens with and at risk of diabetes. For healthcare providers, it is a call to improve knowledge so that evidence based recommendations are put into practice.

Sr. usha, M.S.M.I, (1998) A study regarding properties of fenugreek. The report confirms that antihyperglycemic and antidyslipidemic properties of fenugreek is due to 4-hydroxyisoleucine an unusual amino acid. The result indicates that 4-hydroxyisoleucine exhibits significant potential as an anti-diabetic agent which enhances insulin sensitivity and glucose uptake in peripheral tissue.

G.Y .Yeh et al., (2003) A study was conducted with objectives of finding out the efficacy of three herbal powder namely Fenugreek seed powder; Kasini leaves powder and Kizhanelli shoot powder on type II diabetes. Among the three herbs selected sprouted Fenugreek seed powder was found to be more effective followed by kasini leaves powder and Kizhanelli shoot power. This study concluded that the Fenugreek seed powder in the diet reduces blood sugar and urine sugar with concomitant improvement in glucose tolerance and diabetic symptoms in both type I and type II diabetic patients.

Fenugreek (Trigonella foenum-graecum in latin),also known as greek hay or fenugreek was used to treat a whole slew of aliments in ancient Egypt, Greece and Rome, everything from bronchial problems to low libido. Indian ayurvedic and traditional, Chinese medicine recommend fenugreek to treat arthritis and bronchitis, induce labour, improve digestion, and maintain healthy metabolism.

Trigonella foenum-graecum (fenugreek) has been used in traditional medicine for the management of diabetes. fenugreek has been demonstrated to lower blood glucose in response to a glucose load while leaving the levels of serum insulin unaffected in rodents. This effect of lowering blood sugar without changing insulin levels demonstrates improved insulin action.

Fenugreek was among ten more frequency suggested herbal remedies. The investigator’s experience with family members and information collected on home remedy for Diabetes Mellitus showed that blood sugar level can be maintained by

using fenugreek seed power. Based on the prevalence of diabetes and availability of fenugreek seeds the investigator was motivated to conduct an evaluator study to observe the effectiveness of fenugreek seed powder in reducing the level of blood glucose. There is an important role for nurses to help people understand the risks and set realistic goals to improve health.

Fenugreek seeds may help lower blood sugar and reduce the need for insulin .It may also improve glucose tolerance and excretion. Fenugreek helps in maintaining good metabolism and prevents constipation. It purifies blood and helps in flushing out the harmful toxins. It helps in dissolving excess thereby making the digestive organs refreshed and clean. Also fenugreek seed are useful in improving memory power. This natural herb has very potent seeds, which help treat balding, thinning of hair and hair fall.

This herb is very effective is losing weight. With the assistance of proper diet and exercise, fenugreek can work wonders on human body. The fibre in fenugreek fills the stomach, even when consumed in a little amount. Soak a few fenugreek seeds in water and chew them in the morning, on an empty stomach.

Bhuvanaygsr, (2011). Fenugreek seeds and leaves are strongly aromatic and flavorful. Seeds are bitter in taste but lose their bitterness if roasted slightly. They are rich in vitamins such as thiamin, folic acid, riboflavin, niacin, vitamins A, B6, and C, and are a storehouse of minerals such as copper, potassium, calcium, iron, selenium, zinc, manganese, and magnesium. Fenugreek leaves are a rich source of vitamin K.

Gupta & Arvind, (1998). Fenugreek has so many usages almost too numerous to count, however scientists have been able to narrow down fenugreek has two functions Viz the ability to reduce blood sugar and cholesterol. With its ability to lower blood sugar, fenugreek may hold a special interest by people who suffer from diabetes. Due to the high content of soluble fiber, it has long been assumed that the benefit of

fenugreek seeds for diabetes lies with its ability to modulate plasma glucose levels by delaying gastric emptying and by direct interference with glucose absorption.

Cicero et al (2003) distributed a questionnaire to all herbalists asking formation about the herbal remedy and dietary supplement to control hyperglycemia. Fenugreek was among ten more frequency suggested herbal remedies. The investigator's experience with family members and information collected on home remedy for Diabetes Mellitus showed that blood sugar level can be maintained by using fenugreek seed power. Based on the prevalence of diabetes and availability of fenugreek seeds the investigator was motivated to conduct an evaluator study to observe the effectiveness of fenugreek seed powder in reducing the level of blood glucose. There is an important role for nurses to help people understand the risks and set realistic goals to improve health.

STATEMENT OF THE PROBLEM:

"A QUASI EXPERIMENTAL STUDY TO EVALUATE THE EFFECTIVENESS OF ROASTED FENUGREEK SEED POWDER ON BLOOD GLUCOSE AMONG CLIENTS WITH TYPE II DIABETES MELLITUS IN URBAN COMMUNITY HEALTH CENTRE AT KAMARAJAPURAM, PUDUKKOTTAI"

OBJECTIVES:

1. To assess the pre test level of fasting blood glucose among clients with type II diabetes mellitus in the experimental group and control group.
2. To assess the post test level of fasting blood glucose among clients with type II diabetes mellitus in the experimental group and control group
3. To evaluate the effectiveness of roasted fenugreek seed powder on level of fasting blood glucose among clients with type II diabetes mellitus in the experimental group.
4. To find out the association between the post test level of fasting blood glucose with their selected demographic variables in the experimental group.

HYPOTHESES:

H1- The mean post test level of fasting blood glucose level would be significantly lower than the pre test level of fasting blood glucose in the experimental group.

H2 – The mean post test level of fasting blood glucose in the experimental group would be significantly lower than the post test level of fasting blood glucose in the control group.

H3- There would be a significant effectiveness of roasted fenugreek seed powder on the level of fasting blood glucose among clients with type II diabetes mellitus in the experimental group.

H4-There would be a significant association between the post test level of fasting blood glucose with their selected demographic variables among clients with type II diabetes mellitus in the experimental group.

OPERATIONAL DEFINITION:

EVALUATE:

In this study, it refers to the process of checking the level of fasting blood glucose among clients with type II diabetes mellitus before and after consumption of roasted fenugreek seed powder.

EFFECTIVENESS:

In this study, it refers to the outcome of the intervention of roasted fenugreek seed power administration in reducing level of blood glucose among clients with type II diabetes mellitus and it is measured by bio-physiological measures (ACCU-CHECK GLUCOMETER). ACCU-CHECK glucometer is used to measure the level of fasting blood glucose for diabetic clients.

ROASTED FENUGREEK SEED POWDER:

In this study, it refers to the Fenugreek was prepared in the method of roasting the fenugreek seeds in the tava until the raw smell disappears and then it is finally powdered. The researcher prepared a roasted fenugreek seed powder in 25 grams of pocket and it must be taken with 100 ml of water and it is consumed half an hour before breakfast for 28 days.

FASTING BLOOD GLUCOSE:

In this study, it refers to the level of blood glucose which should be checked in an empty stomach. Normal level of fasting blood glucose level is 110-140 mg/dl**.**

TYPE II DIABETES MELLITUS:

In this study, it refers to client who was diagnosed as type II diabetes mellitus and seeking medical treatment in urban community health centre at Kamarajapuram, Pudukkottai.

URBAN COMMUNITY HEALTH CENTER:

In this study, it refers to the specific place to render the essential and primary care which is highly needed for the diabetic clients

ASSUMPTION:

- Natural adjunct therapy will play an important role in reducing blood glucose level among type II diabetes mellitus clients.
- Roasted fenugreek seed powder will have an effect on blood glucose level among clients with type II diabetes mellitus
- Clients with type II diabetes mellitus will accept the roasted fenugreek seed powder as an alternative modality to maintain the blood glucose level.
- All diabetic clients follow dietary regimen as per physician's advice. Diabetic clients may be using some of the home remedies for the reducing blood glucose level.
- Taking roasted fenugreek seed powder continuously for 28 days will reduce the blood glucose level.
- Roasted fenugreek seed powder will not produce any side effects.

DELIMITATION:

- This study was delimited to 70 samples(35 samples are in experimental group and 35 samples in control group)
- The client aged between 31 to 60 years.
- Clients with type II diabetes mellitus who are all taking oral hypoglycaemic agent.
- The data collection period was limited to 6 weeks

PROJECTED OUTCOME:

- The study will enable to identify the blood glucose among type II diabetes mellitus.
- The findings of the study will help the researcher to provide roasted fenugreek seed powder for blood glucose and motivate the type II diabetes mellitus clients and remains in their for longer.

CHAPTER – II
REVIEW OF LITERATURE

A literature review is a written summary of the state of existing knowledge on a research problem. The task of reviewing research literature involves the identification, selection, critical analysis and written description of existing information on a topic.

Polit, D.F. & Hungler B.P,(2006)

The literature review in this study is organized under the following headings,

- Literature related to incidences and prevalence of type II diabetes mellitus
- Literature related to risk factors and complications of type II diabetes mellitus.
- Literature related to management of type II diabetes mellitus.
- Literature related to alternative therapies for diabetes mellitus.
- Literature related to effectiveness of roasted fenugreek seed powder on level of blood glucose among clients with type II diabetes mellitus.

Literature related to incidence and prevalence of type II diabetes mellitus:

Diaz-Rodrigrez MI(2014) was conducted a cross sectional study on the prevalence of diabetes among the family members of known diabetes. Totally, 513 families with one family member from each family responded and family member with diabetic mother, diabetic father, and or parents being diabetic were considered separately. The result of the study shown that the prevalence of diabetes among males were 7.69%, females were 10.38% and the prevalence of 18.24% were in the age group 40-60 years, which was quite high composed with other age groups.

Cander s et al(2014) was conducted a study on the prevalence of diabetes mellitus and impaired glucose tolerance(IGT) among 866 Indians, living in the chatsworth area of Durban. The study group was selected by cluster sampling and the

participants underwent a modified glucose tolerance test (GTT). The result was shown that the overall prevalence of diabetes mellitus was 11% and of IGT 5.8%. Out of 368 men, 7.6% were found to have diabetes mellitus and 7.1% IGT; the prevalence of diabetes mellitus was much greater among women(13.5%), while there was less IGT(4.8%). The study was conclude that obesity is commonly associated with diabetes mellitus and IGT, particularly among women.

Hans J Woele et al., (2013) was conducted a correlational study to assess the relationship of diabetes with gender and marital status an irani urban population. A total of 892 men and woman aged 40-65 were recruited using a cluster stratified sampling method from an urban population. Using a questionnaire, demographic al data including gender, education , and marital status were collected. The prevalence of diabetes mellitus was 11.6% and 11.1% in men and 12.1% in women with no significant difference between them. Diabetes mellitus was most prevalent in low education groups(17.9%,p<0.001).

Alavudeen ss et al., (2013) was conducted a study population based on the prevalence and associated factors of diabetes among 1638 Southern Taiwan subjects (780 men and 858 women) aged >/=20years. The result of the study shown that crude prevalence of diabetes in Tainan was 9.0% (10.3% men and 7.9% women) and the age-adjusted prevalence was 9.2% (10.4% men and 8.1% women) respectively. This study is concluded that the significant factors associated with the newly diagnosed diabetes were age, family history of DM, BMI, systolic blood pressure, physical activity, and serum triglyceride levels.

G.Y. Yeh et al., (2010) was conducted by M V Hospital for Diabetes and Diabetes Research Centre, an association of the World Health Organization Collaborating Centre for Diabetes in India. It has been found that more than 35 million Indians suffer from diabetes. Alarmingly, as much as 13 million cases (50% in rural India and 30% in urban India) remains undiagnosed, leading to long-term

complications. Various factors such as widespread urbanization reduced physical activity, the consequent obesity, stress and several other environmental factors have been accounted for the high incidence of diabetes in India.

Shekar Shak, (2010) was conducted a study in India on the incidence of nephropathy in newly diagnosed type 2 diabetics and to study the relationship of development of nephropathy with various risk factors associated with DM, like age, sex, blood pressure, etc. A total number 300 newly diagnosed type 2 diabetics (diagnosed within 6 months) were taken. Results revealed that incidence of 17.34% (52/300) nephropathy in newly diagnosed type 2 diabetes. It increased significantly with increase in age and was 30% in age group >60 years. This study concludes that Incidence of nephropathy in newly diagnosed of type II diabetics is as high as 17.34%.

Jones et al., (2008) was conducted a cross-sectional study carried out among the Indian housewives and their family members (mean age 39.6 years, 6764 females) by using a stratified random sampling technique. Information on behavioural, clinical and biochemical risk factors of DM was obtained, through standardized instruments. DM was diagnosed when fasting blood glucose was ≥ 7.0 mmol/l and/or individuals took drug treatment for DM. The result of the study shown that in the 20 to 69-year-old age group, the crude prevalence of DM and impaired fasting glucose was 10.1 and 5.3%, respectively. The study was concluded that the individuals in the lower education group had a HIGH prevalence of DM (11.6%). In diabetic subjects, 38.4% were unaware that they had diabetes.

Literature related to risk factors and complications of type II diabetes mellitus

Ajay kumar (2012) was conducted a study in India to assess the pattern and causes of amputations in diabetic patients across various parts of India. A total of 1985 (M:F 1249:736) type II diabetic subjects were selected from 31 centers across India. A

total of 1295 (850:445) patients had undergone amputations among study participants. Results revealed that the major cause for the occurrence of amputations among the patients was infection (90%). Among the subjects who underwent major amputations, more than 50% accounts for below knee amputations and 11.9% above knee amputations. Prevalence of neuropathy (82%) was high and 35% had peripheral vascular disease.

In conclusion, infection was found to be the major cause of amputation in India. Below knee, toes and rays amputations were the most common type of amputations. Diabetic patients should be educated on foot care and importance of proper foot wear.

Aana J(2011) Cardiac autonomic neuropathy is a serious complication among diabetic patients. It occurs in both type I and type II diabetes, and its progression results in poor prognosis and increased mortality. During its course, para sympathetic and sympathetic nervs fibres of the cardio vascular system are damaged resulting in potentially serious cardiac complications and even death. Poor glycemic control is believed to play a pivotal role in the pathogenesis of cardiac autonomic neuropathy. Several clinical manifestations of cardiac autonomic neuropathy have been reported, including resting tachycardia, exercise intolerance, loss of heart rate variability, orthostatic hypotension, prolonged QT interval, silent ischaemia, and sudden death. Diabetic patients exhibiting these signs and symptoms are at greater risk of anaesthesia-related complications. A serious of noninvasive autonomic tests were developed for the diagnosis of cardiac autonomic neuropathy, improving the management of diabetic patients requiring general anaesthesia. These patients often experience cardiovascular events that may increase perioperative morbidity and mortality. The presence of cardiac autonomic neuropathy alters the hemodynamic response to induction and tracheal intubation during general anaesthesia,resulting in

intraoperative hypotension. A thorough preoperative assessment and vigilant monitoring perioperatively ensure successful anaesthesia management.

Josie M et al., (2006) was conducted a study to Diabetic microvascular complications--can the presence of one predict the development of another. The number of people with diabetes is increasing dramatically worldwide. The rising prevalence of obesity in childhood and adolescence has also been linked to a starting increase in the number of diagnosed cases of type II diabetes in these younger age groups. Despite the introduction of treatment strategies, diabetes remains a major cause of new-onset blindness, end-stage renal disease, and lower leg amputation, all of which contribute to the excess morbidity and mortality in people with diabetes. Furthermore, the management of diabetes-related complications generates substantial costs. In order that timely treatment can be given, it is essential that patients at risk for the development of diabetic microvascular complications are identified earlier. Diabetes duration and glycemic, blood pressure, and lipid control have consistently been shown to correlate with diabetic retinopathy, neuropathy, and nephropathy, but to date, the relationship of one diabetic microvascular complication to another has not been clearly described. A review of the literature has raised the question that apart from other known risk factors, there is a possible relationship among the diabetic microvascular complications themselves, and this appears to be much stronger than the sparse published data on it would suggest. A scoring system that can predict the development of diabetic microvascular complications may facilitate the early identification of those patients at risk and consequently have a positive impact on patients' quality of life and reduce the economic burden of diabetes and its complications.

Gupta & Arvind, (2000) was conducted a study on prevalence of diabetic retinopathy in type II Diabetes conducted in S.P. Medical College, Bikaner. The study carried out on 4069 subjects showed evidence of retinopathy in 1176 patients (28.9%).

This comprised of 938 cases (79.8%) of Non-Proliferative diabetic Retinopathy, 68 cases (5.8%) of Maculopathy and 172 cases (14.6%) of Proliferative Diabetic Retinopathy.

Literature related to management of type II diabetes mellitus

Maureen Shaun Kennedy, (2010) was conducted a study to assessed the effect of self-care management intervention in type II diabetes. To assess the effects of self-care management interventions in improving glycemic control in type II diabetes by analyzing the impact of different study characteristics on the effect size. The 47 included studies yielded 7677 participants. The analysis showed a 0.36% (95% CI 0.21–0.51) improvement in glycemic control in people who received self-care management treatment. In the univariate meta-regression sample size (effect size 0.42%, $p = 0.007$) and follow-up period (effect size 0.49%, $p = 0.017$) were identified to have significant effect on the effect size in favour of small studies and short follow-up. For type of intervention and duration of intervention there was a non-significant effect on effect size in favour of educational techniques and short interventions.

Utz et al (2008) conducted a Diabetes Self Management Education (DSME) interventions were tailored culturally to assist rural African Americans in changing the outcomes of type II diabetes. Twenty- two participants were assigned randomly to either group or individual DSME group sessions included storytelling, hand-on activities, and problem-solving exercises, whereas individual DSME sessions focused only on goal setting and problem solving. They have found participants in both the individual and group DSME showed slight improvement in self-care activities, Hb A1C levels, and goal attainment. The group DSME participants showed improved scores on dietary actions, foot care, goal attainment, and empowerment in diabetes self-management in a community with few resources and little assistance from health professionals.

Jones et al (2006) was conducted a study carried out a quasi-experimental intervention focused on the importance of family and friends when assisting with diabetic education for African Americans. Family and friends were invited to group session to learn about peer support and diabetes. These findings confirm that family and peers greatly influence diabetes management among rural African Americans. The study's results will help health care providers understand the importance of involving family members and friends in the treatment and diabetes management of individuals with type II diabetes, particularly within rural African American communities where resources are limited.

Literature related to alternative therapy for diabetes mellitus

Arwind Singh(2012) Conducted an experimental study on "complimentary and alternative medicine for patients with type II Diabetes was conducted in Tamilnadu. The sample selected was 50.In one trial, 25 patients consumed 1g of seed extract or placebo for 2 months with no change in fasting blood glucose levels. In a small crossover study, 10 patients added 25 g of defatted seed powder to one meal or ate the meal without the powder for 15 days. Several measures of glucose metabolism were unchanged. A third trial, which used a higher dose(100g) of defatted seed powder in 15 patients for 10 days did report improvements in fasting blood glucose values. The researcher concluded that there was a significant improvement in the blood glucose level of the patient with type II Diabetes mellitus due to fenugreek treatment.

Awanish pandey(2011) Conducted an experimental study on the effect of fenugreek seeds in reducing fasting and postprandial(after a meal) blood glucose levels in diabetic patients was conducted at National Institute Of Nutrition, Indian council of Medical Reasearch, Jamia osmania, Hyderabad. The sample selected was 10.Diets with or without 25 grams of fenugreek seed powder, were given randomly to 10 non-insulin dependent patients, each for 15 days ,in a cross-over design. An intravenous glucose tolerance test(GTT) at the end of each study period indicated that fenugreek

powder significantly reduced the area under the plasma glucose curve and increased the metabolic clearance rate. In addition, it increased erythrocyte insulin receptors. The results suggested fenugreek can improve peripheral glucose utilization which contributes to improvement in glucose tolerance. Fenugreek appears to exert its hypoglycemic effect by acting at the insulin receptor as well as the gastrointestinal level. The research result showed that fenugreek can improve peripheral utilization which contributes to improvement in glucose tolerance.The researcher concluded that there was significant improvement in the blood glucose level of the patients with type II Diabetes Mellitus due to fenugreek treatment.

Russell J de Souza(2012) conducted an experimental study on ”The effect of a high fibre diet, fenugreek and other herbal agents in the management of Diabetes mellitus” was conducted in Department of Endocrinology at the Institute of Medical Sciences, Srinagar. The sample selected was 42 patients who attended the outpatient clinic at the hospital based upon certain definite criteria. They were then divided in to 3 groups. Groups I Comprised 14 patients who were fed 10 gm of the powdered fenugreek seeds per day. Group II Comprised 14 patients who were fed 20 gm of the powdered fenugreek seeds per day. Group II Comprised 14 patients who were not fed with any powdered fenugreek seeds but were continued on the diet and drug regimen already prescribed. Patients were assessed for 6 weeks fortnightly.HbA1c was estimated initially and then at the end of 6 weeks by HPLC method. Blood glucose was periodically estimated along with clinical assessment, dietary survey, and laboratory studies. The blood sugar levels in Group II showed a significant drop in fasting sugar levels but the decrease was insignificant in Group I and III. The difference in HbA1C levels was statistically insignificant.

Rob M Van Dam(2012) conducted a study to find out the effect of consumption of powdered fenugreek seeds on blood sugar and glycoslated haemoglobin level in client with type II Diabetes, in Kashmir. 28 patients were divided

in to 3 groups,10 gm and 20 gm of powdered fenugreek powder. patients were assessed initially and for subsequent 6 weeks on fortnightly basis. The study finding revealed that in group I the initial fasting blood sugar was 139±33.4 and at the end of 6 week was 121±25.1 and in group II initially 175±74.2 and at the end of 6 week 108±31.4, group III initially 143±52.6 and at the end of six weeks 125±56.2

Literature related to effectiveness of roasted fenugreek seed powder on level of blood glucose among clients with type II diabetes mellitus

American Diabetes Association, (2013) was conducted a study report the characterization of a new insulinotropic compound, 4-hydroxyisoleucine. This amino acid has been extracted and purified from fenugreek seeds, which are known in traditional medicine for their anti diabetic properties. 4-Hydroxyisoleucine increases glucose-induced insulin release, in the concentration range of 100 μmol/l to 1 mmol/l, through a direct effect on isolated islets of Langerhans in both rats and humans. This secret agent may be considered as a novel drug with potential interest for the treatment of Non Insulin Dependent Diabetes Mellitus (NIDDM).

Hans J Woele et al., (2013) was carried out a study to determine whether an increased dietary fiber affects glycosylated hemoglobin (HbA_1c) and fasting blood glucose in patients with type II Diabetes Mellitus. The results showed that the overall mean difference of fiber versus placebo was a reduction of fasting blood glucose of 0.85 mmol/L(95% CI, 0.46-1.25) and decrease in HbA_1c with an overall mean difference of 0.26% (95% CI, 0.02-0.51). They have concluded that increasing dietary fiber in the diet of patients with type II diabetes is beneficial and should be encouraged as a disease management strategy.

Kaviarasan, S. et al ., (2012) was conducted a study to assessed the effect of Trigonellin, a plant alkaloid with therapeutic potential for diabetes and central nervous system disease. Trigonelline has hypoglycemic, hypolipidemic, neuroprotective,

antimigraine, sedative, memory-improving, antibacterial, antiviral, and anti-tumor activities, and it has been shown to reduce diabetic auditory neuropathy and platelet aggregation. It acts by affecting β cell regeneration, insulin secretion, activities of enzymes related to glucose metabolism, reactive oxygen species, axonal extension, and neuron excitability.

Madar, Z. Abel et al., (2012) was conducted a study to assessed the effect of fenugreek seed powder for Type II Diabetes Mellitus patients. The patients were given 15 grams per day of powdered fenugreek mixed with 100ml of water for 28 days. Findings showed that random blood glucose decreased up to 40% to 50%. The study revealed that fenugreek powder is an effective measure to keep the blood glucose level under control.

Saxena, A & Vikram N.K, (2011) was performed a systematic review and meta-analysis to evaluate the effect of herbal supplement on glycemic control in type II Diabetes Mellitus. Randomized controlled trials were identified through electronic searches (MEDLINE, EMBASE and Cochrane Central Register of Controlled Trials) up until February 2011. The result showed that Ipomoea batatas, Silybum marianum and trigonella foenum-graecum significantly improved glycemic control. The pooled mean differences in HbA_1C were -0.30%(95% CI-0.04% to -0.57; P=0.02), -1.92%(95% CI-0.51% to -3.32%; P=0.008), and -1.13%(95% CI-0.11% to -2.14%; P=0.03),respectively, for Ipomoea batatas, silybum marianum, and Trigonella foenum-graecum. They have concluded that the supplementation with Ipomoea batatas, Silybum marianum and Trigonella foenum-graecum may improve glycemic control in type II diabetes mellitus.

Saraswathi, (2011)was carried out a study to evaluate the potential of fenugreek (Trigonella foenum- graecum) as a functional food and neutraceutical and its effects on glycemia and lipidemia. Dietary fiber from fenugreek blunts glucose and cholesterol after a meal and regulates the production of cholesterol in the liver.

The mechanisms for these effects have not been fully elucidated. Fenugreek seeds contain 45.4% dietary fiber (32% insoluble and 13.3% soluble), and the gum is composed of galactose and mannose. The latter compounds are associated with reduced glycemia and cholesterolemia. Fenugreek's hypoglycemic effect has been especially documented in humans and animals with type I and type II diabetes mellitus

Central Drug Research Institute, (2010) conducted a study regarding properties of fenugreek. The report confirms that anti hyperglycemic and anti dyslipidemic properties of fenugreek is due to 4-hydroxyisoleucine an unusual amino acid. The result indicates that 4-hydroxyisoleucine exhibits significant potential as an anti-diabetic agent which enhances insulin sensitivity and glucose uptake in peripheral tissue.

Sorma Vira, (2010) conducted a clinical trial with 24 Type II Diabetes Mellitus patients. The patients were given 10 grams per day of powdered fenugreek mixed with yogurt for 3 months. Findings showed that fasting blood glucose decreased up to 25% to 30%. The study revealed that fenugreek powder is an effective measure to keep the blood glucose level under control.

. **Pathak, P et al ., (2010)** was assessed the effect of supplementation of a powdered mixture of three traditional medicinal plants-bitter gourds, jamun seeds, and fenugreek seeds-in raw and cooked form on blood glucose was studied in 60 non-insulin-dependent male diabetics. Daily supplementation of 1 g of this powdered mixture for a 6 weeks period and then a further increase to 2 g for another 6 weeks significantly reduced the fasting as well as the postprandial glucose level of the diabetic patients. A significant decrease in oral hypoglycemic drug intake and decline in percentage of the samples who were on hypoglycemic drugs were found after the 3-month feeding trial. It was concluded that 2 g of a powdered mixture of traditional medicinal plants in either raw or cooked form can be successfully used for lowering blood glucose in diabetics.

Suvarna Vira, (2010) conducted a study to evaluate efficacy of fenugreek in the treatment of type 2 diabetes mellitus. Sixty-nine type II diabetes mellitus patients whose blood glucose levels were not well controlled by oral sulfonylurea's hypoglycemic drug were randomly assigned to the treated group (46 cases) and the control group (23 cases), and were given Trigonella Foenum- Gracecum (TFG) or placebo three times per day, 6 pills each time for 12 weeks, respectively. They concluded that the combined therapy of TFGs with sulfonylurea's hypoglycemic drug could lower the blood glucose level and ameliorate clinical symptoms in the treatment of type II diabetes mellitus, and the therapy was relatively safe.

Analava mitra et al., (2010) conducted an evaluative study to assess the effectiveness of fenugreek among type II diabetes mellitus patients in rural Bengal. The study included 50 type II diabetes mellitus patients. The result showed a significant decline in fasting blood glucose level and decline was corresponding to the dose of fenugreek.

Shanthi Johnson & Leah Macaden, (2006) conducted a study in Annamalai University, Tamilnadu, to evaluate the protective effect of a poly phenol rich extract from the seeds of fenugreek against hydrogen per oxidation in normal and diabetic human erythrocytes. Red blood cells incubated with increasing amount of fenugreek seeds extract and challenged with hydrogen peroxide were analyzed for hemolysis and lipid per oxidation. Red blood cells from diabetic samples were more susceptible to oxidative hemolysis and lipid per oxidation than those from normal samples. Per oxidation with poly phenol rich extract significantly reduced the oxidative modification in both the groups. The findings demonstrate the potent anti oxidant properties of fenugreek seeds.

Josie M et al., (2006) was Conducted a quasi experimental study including 25 newly diagnosed patients with type II Diabetes Mellitus with fasting blood glucose less than 200mg/dl. The first group of 12 patients were given fenugreek seed powder

and 13 were assigned to control group. The mean fasting blood glucose after 2 months for experimental and control group were 137.5± 41.1 and 148.3±44.1. This proved that the adjuvant use of fenugreek seed improves glycemic control and decrease insulin resistance in mild Type II Diabetes Mellitus.

Sharma, R.D. Raghuram, (2000). Conducted a prospective one arm study of dietary fenugreek in 60 patients with Type II Diabetes Mellitus of different severity level. Among these 40 patients were taking oral hypoglycemic drugs. Each patients underwent 7 days of control diet, flowed by 4 weeks of 25 grams fenugreek seed powder intake in a soup diet of each patients was similar in calorie and nutrient composition except for higher fiber content in fenugreek diet. Mean blood glucose level decreased from baseline 241 to 199 mg/dl and 179 to 149 mg/dl as an average.

Ramesh kumar et al., (2000) was conducted a study to says that the ancient ayurveda and folk writing of India too look for some herbal cures for mild cases of diabetes mellitus. Herbs found to be effective curative herb for this problem. A tablespoonful of fenugreek juice taken early in the morning for about 3 months has been found to cure early stages of Diabetes Mellitus. The powder of fenugreek seeds taken twice a day with curd is also effective to find positive results.

Sunder Rao, P.S., Richard J, (2000) conducted a review in Department of Central Food Technological Research Institute, Mysore regarding diet as a cornerstone in the management of type II Diabetes Mellitus. Spices are the common dietary adjuvant that several beneficial physiological effect including the anti-diabetic influence. The review considered all the available information of spices, their extracts or their active principles were examined for treatment of Diabetes Mellitus. Among the spices, fenugreek seed have been experimentally documented to possess anti-diabetic property.

Garg & Colleagues, (2000) was determined the beneficial hypoglycemic effect of millets, fenugreek seeds and legumes in diabetic samples. However, the bitter taste of fenugreek seeds and coarse nature of millets have been limitations in using them in daily dietaries. Moreover, as of today, the availability of special foods for diabetics in the Indian market is negligible. The millets, fenugreek seeds and legumes in judicious combination, after suitable processing, were used to formulate three nutritious food products-dhokla (leavened steamed cake), uppuma (kedgeree) and laddu (sweet balls), which are popular traditional snack foods in India. Evaluation of these food products for glycemic response in five normal and five diabetic samples showed hypoglycemic effects in terms of glycemic-index (GI). The highest GI was observed for dhokla (34.96) followed by laddu (23.52) and uppuma (17.60) in normal samples.

Jean-Louis Chiasson et al., (2000) was reviewed study done on diet fiber and found soybean and fenugreek as potentially beneficial in the reduction of plasma glucose in Non-Insulin Dependent Diabetes Mellitus (NIDDM) samples. They are shown to be acceptable by human samples and are easy to use either in a mixture of milk products and in cooking.

CONCLUSION:

The above review of literature shows that the type II diabetes mellitus clients are encouraged to take roasted fenugreek seed powder in reducing the blood glucose level. The roasted fenugreek seed powder is very effective.

CONCEPTUAL FRAMEWORK

This study based on "**J . M. KENNY'S OPEN SYSTEM MODEL"** all living system are open in that there is a continuous exchange of matter, energy, and information open system have varying degree of interaction with the environment from which the system input, output and gives back output in the form of matter, energy and information.

The main concept of the open system model all inputs, throughput, output and feedbacks in open system theory.

Input refers to matter, energy, and information that are processed. After processing Input, the system return output (Matter, energy, information) to the environment in an altered state. Feedback refers to environmental responses to the systems. output used by the system in adjustment, correction and accommodation to the interaction with the environment.

This study is to determine the effectiveness of roasted fenugreek seed powder among the study group. A roasted fenugreek seed powder was given among type II diabetes mellitus for the study as on input process the throughput process involves the intake of roasted fenugreek seed powder (25gm) in 100 ml of water in an empty stomach.

The post test value will debit transformation of effectiveness of roasted fenugreek seed powder as an output process, which would show possible decrease in blood glucose among clients with type II diabetes mellitus.

The model kenny's open system, the best suited for this study which was undertaken to determine the effectiveness of roasted fenugreek seed powder among clients with type II diabetes mellitus.

CHAPTER – III

METHODOLOGY

Methodology of research refers to their investigator of the ways obtaining organizing and analyzing methodological data. Studies address the development Validation and evaluation of research tools and methods. (**Ranjan das,2011).**

This chapter describes the methodology followed to evaluate the effectiveness of fenugreek seeds powder on reducing blood glucose among clients with type II diabetes at urban community health centre at Kamarajapuram, Pudukkottai.

This phase of the study included selected a research approach, design, the setting population, sample size and the sampling technique, inclusive and exclusive criteria for selection of sample variable, development and description of tools, data collection and plan for data analysis.

RESEARCH APPROACH:

Quantitative approach was used to evaluate the effectiveness of roasted fenugreek seed powder.

RESEARCH DESIGN:

Quasi experimental, Non randomized control group [pretest post test control group design] was used for this study.

GROUP DESIGN

Type II diabetes mellitus clients	**Pre test**	**intervention**	**Post test**
Experimental	O1	X	O2
Control	O1	-	O2

O1- pretest level of fasting blood glucose in the experimental group and control group.

O2 -post test level of fasting blood glucose in the experimental group and control group.

X- Consumption of 25 gms of roasted fenugreek seed powder in 100 ml of water.

VARIABLE:

INDEPENDENT VARIABLE: Roasted fenugreek seed powder.
DEPENDENT VARIABLE: Clients with type II diabetes mellitus

SETTING:

The study was conducted at urban community health centre, kamarajapuram, pudukkottai District. The distance between college and the urban centre was 10 km. The reasons for selecting this centre was the availability of samples, facility for the study and expectation of cooperation from the community people for collection of data.

POPULATION:

The population of the study was clients with type II diabetes mellitus who were taking oral hypoglycaemic drugs.

TARGET POPULATION:

The target population of the study was clients with type II diabetes mellitus between the age of 31 to 60 years.

ACCESSIBLE POPULATION:

The accessible population of the study was clients with type II diabetes mellitus between the age of 31 to 60 years taking treatment in urban community health centre at Kamarajapuram, Pudukkottai.

SAMPLE

The sample for this study was type II diabetes mellitus who were taking oral hypoglycaemic drugs, in the age group of 31 to 60 years.

SAMPLE SIZE

The sample size for this study was 70. In that, 35 samples were in experimental group and 35 samples were in control group.

SAMPLING TECHNIQUE

Non probability Purposive sampling technique was adopted in this study.

CRITERIA FOR SAMPLE SELECTION

INCLUSION CRITERIA

- Clients who had type II diabetes mellitus
- Clients who were available during the time of data collection.
- Clients who were on regular treatment.
- Clients who were both males and females.
- Clients with type II diabetes mellitus who were taking oral hypoglycaemic agents
- Type II diabetes clients who were willing to participate in the study.

EXCLUSION CRITERIA

- The age group who were below 20 years and above 60 years.
- Clients who were pregnant and lactating mothers.

DESCRIPTION OF THE TOOL

The instrument was developed by the investigator with the guidance of experts. The tool consist of two parts.

SECTION-I

It consists of selected demographic variable age, gender, marital status, religion, educational status, occupation, monthly income, following diabetic diet, regular exercise, duration of illness, family history.

SECTION- II

Clinical variable such as standardized glucometer[ACCU CHECK] was used to assessed the level of fasting blood glucose .

SCORING PROCEDURE

Mild	115-14O mg/dl
Moderate	141-165 mg/dl
Severe	Above 165 m g/dl

VALIDITY AND RELABILITY OF THE TOOL:

VALIDITY:

The validity of the tool is established by consultation with guide and five experts in the field of Medical surgical nursing, one in the field of general medicine. The experts were requested to check the relevance of the tool.The tool was modified according to the suggestions and recommendations given by them.

RELIABILITY:

Reliability of an instrument is the degree of consistency measures that attribute it is supposed to be measured. Reliability of the level of fasting blood glucose was measured by using standardized glucometer. Manufactuer's instructions were followed while operating the device.

Realiability of the tool was estimated in the study of subjects by using test-retest method. The post test was conducted 28 days after the pretest to the same group of type II diabetes mellitus clients.Then the scores obtained were correlated. Realiability was computed using karl pearson correlational coefficient and it is found to be 1,which was highly positively correlated. The tool was found to be reliable.

PILOT STUDY:

A pilot study was conducted at urban community health centre, Kamarajapuram, Pudukkottai for a period of one week a total 8 sample of type II diabetes mellitus were selected(4 experimental group and 4 control group).The sample is selected by purposive sampling technique.

There was no modification done in the study and the pilot study samples were excluded from the main sample for the data collection. The data collection was amenable to statistical analysis and does the study was found to be feasible.

Informed consent was obtained and demographic variable were collected from the type II diabetic client aged between 31-60 yrs, the fasting blood glucose level was checked and 25 gms of roasted fenugreek seed powder was given in morning with empty stomach for about one week then post test was done after the pilot study, the feasibity and practicability of the tool was assessed.

PROCEDURE FOR DATA COLLECTION:

The period of data collection was conducted for one month. A formal written permission was obtained from commissioner and municipality health officer, Kamarajapuram,Pudukkottai district to carry out the main study. Samples were selected with Non probability purposive sampling technique and quasi experimental [pretest posttest control group] design was used. The data was collected on all seven days of the week. The timing of data collection was day timing.

On selection of the study subject, self introduction was given. Informed Consent was obtained. Roasted fenugreek seed powder was given for 28 days.

ETHICAL CONSIDERATION:

The dissertation committee prior to the pilot study approved the research; Permission was obtained from the principal and medical officer of the urban community health care centre, Pudukkottai. The written consent was obtained from each participant of study before starting data collection. Assurance was given to the subject. The institutionalized type II diabetes mellitus clients were informed that they were free to withdraw from the study at any time.

PLAN FOR DATA ANALYSIS:

The collected data would be arranged and tabulated to represent the finding of the study.Both descriptive and inferential statistics would be used.

Descriptive statistics, numbers, percentage, mean and standard deviation were used to analyze the demographic variables.

For the distribution of demographic data simple percentage would be used.

Un paired “t” test would be used to compare the post test fasting blood glucose level between the experimental group and control group. Paired’ t’ test would be used to find out the difference between pretest and post test Chi-square test would be used to find out the association between demographic variables and post test fasting blood glucose level among experimental group.

CHAPTER – IV

DATA ANALYSIS AND INTERPRETATION

This chapter deals with the analysis and interpretation of the data collected from 70 clients with type II diabetes mellitus (35 Experimental and 35 Control) in selected Urban community Health Centre, Kamarajapuram, Pudukottai.

The data collected was organized, tabulated and analyzed according to the objectives. The findings based on the descriptive and inferential statistical analysis are presented under the following sections.

OBJECTIVES:

1. To assess the pre test level of fasting blood glucose among clients with type II diabetes mellitus in experimental group and control group.
2. To assess the post test level of fasting blood glucose among clients with type II diabetes mellitus in experimental group and control group
3. To evaluate the effectiveness of roasted fenugreek seed powder on fasting blood glucose level among clients with type II diabetes mellitus in the experimental group.
4. To find out the association between the post test level of fasting blood glucose level with their selected demographic variables in experimental group.

ORGANIZATION OF DATA

Section A: Description of demographic variables of the clients with type II diabetes mellitus in experimental and control group.

Section B: Assessment of pretest and posttest level of fasting blood glucose among clients with type II diabetes mellitus in experimental and control group.

Section C: Comparison of pretest and post test level of fasting blood glucose among clients with type II diabetes mellitus in experimental and control group.

Section D: Association of post test level of fasting blood glucose among clients with type II diabetes mellitus with selected demographic variables.

SECTION A: DESCRIPTION OF DEMOGRAPHIC VARIABLES OF THE CLIENTS WITH TYPE II DIABETES MELLITUS IN EXPERIMENTAL AND CONTROL GROUP.

Table 1: Frequency and percentage distribution of demographic variables of clients with type II diabetes mellitus in experimental and control group.

n=70(35+35)

Demographic Variables	Experimental Group		Control Group	
	No.	%	No.	%
Age in years				
31 - 40 yrs	3	8.57	1	2.86
41 - 50 yrs	20	57.14	25	71.43
51 - 60 yrs	12	34.29	9	25.71
Gender				
Male	13	37.14	11	31.43
Female	22	62.86	24	68.57
Marital status				
Married	35	100.00	35	100.00
Unmarried	0	0.00	0	0.00
Divorced	0	0.00	0	0.00
Widow/Widower	0	0.00	0	0.00
Religion				
Hindu	18	51.43	26	74.29
Christian	4	11.43	4	11.43
Muslim	13	37.14	5	14.29
Educational status				
Non formal education	1	2.86	10	28.57
High school	22	62.86	4	11.43

Demographic Variables	Experimental Group		Control Group	
Higher secondary	2	5.71	6	17.14
Graduate	10	28.57	15	42.86
Occupation				
Business	16	45.71	9	25.71
Government employee	13	37.14	13	37.14
Private sector	2	5.71	9	25.71
Coolie	4	11.43	4	11.43
Monthly income				
<5000	1	2.86	2	5.71
5000 – 10000	20	57.14	13	37.14
10000 – 15000	7	20.00	8	22.86
>15000 above	7	20.00	12	34.29
Following diabetic diet				
Yes	4	11.43	3	8.57
No	31	88.57	32	91.43
Practising regular exercise				
Yes	7	20.00	4	11.43
No	28	80.00	31	88.57
Duration of illness				
<2 yrs	6	17.14	22	62.86
2 - 5 yrs	22	62.86	13	37.14
>5 yrs	7	20.00	0	0.00
Do you have any family history of diabetes mellitus				
Yes	6	17.14	5	14.29
No	29	82.86	30	85.71

The table 1 reveals that in the experimental group, majority 20(57.14%) were in the age group of 41 – 50 yrs, 22(62.86%) were female, almost all 35(100% were married, 18(51.43%) were Hindus, 22(62.86%) had high school education, 16(45.71%) occupation was business, 20(57.14%) had monthly income of 5000 – 10000, 31(88.57%) were not following diabetic diet, 28(80%) were not practising regular exercise, 22(62.86%) were suffering from illness for 2 – 5 years and 29(82.86%) had no family history of diabetes mellitus.

Whereas in the control group, majority 25(71.43%) were in the age group of 41 – 50 yrs, 24(68.57%) were female, almost all 35(100% were married, 26(74.29%) were Hindus, 15(42.86%) were graduates, 13(37.14%) were government employee, 13(37.14%) had monthly income of 5000 – 10000, 32(91.43%) were not following diabetic diet, 31(88.57%) were not practicing regular exercise, 22(62.86%) were suffering from illness for <2 years and 30(85.71%) had no family history of diabetes mellitus.

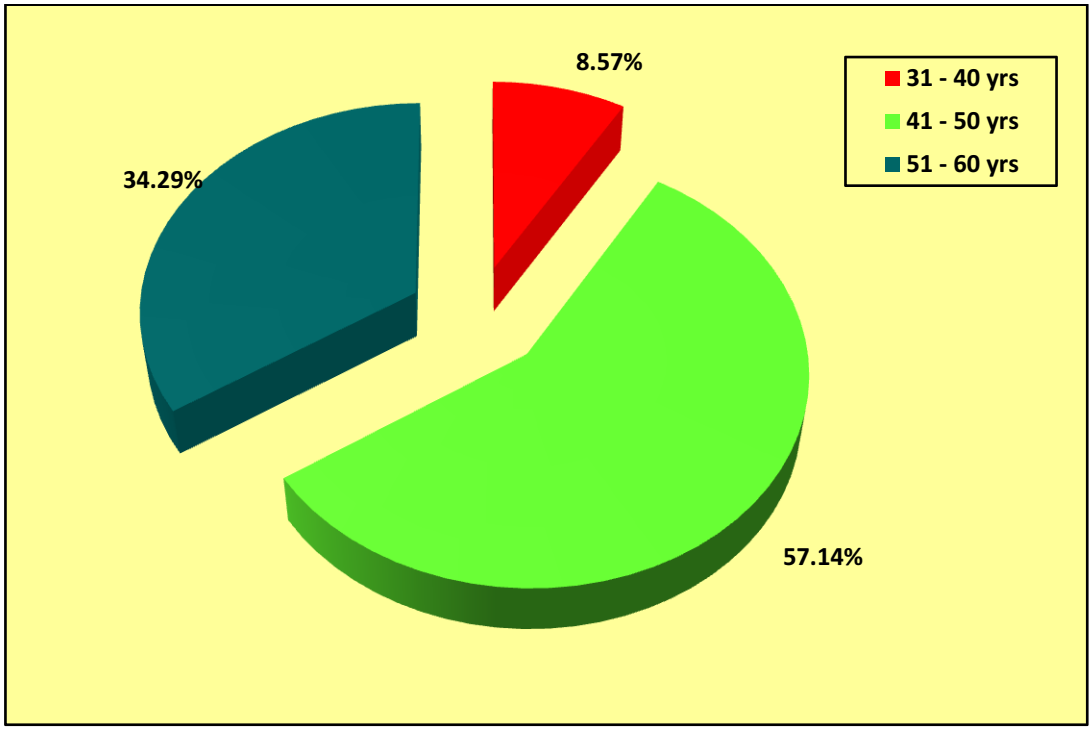

Figure 3: Percentage distribution of age of clients with type II diabetes mellitus in the experimental group

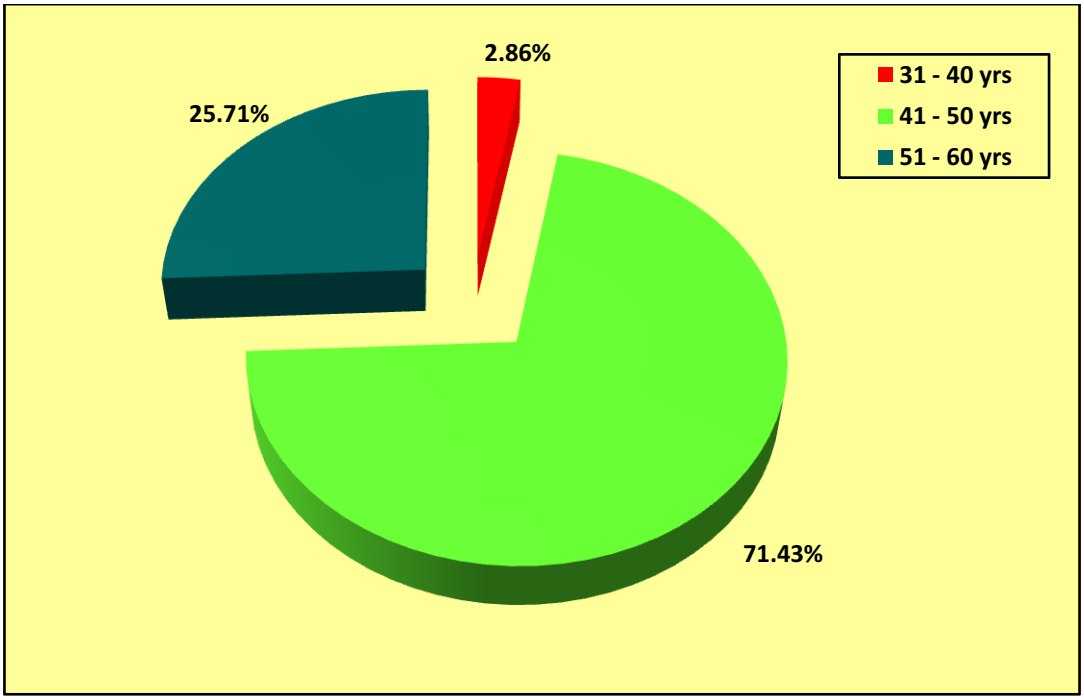

Figure 4:Percentage distribution of age of clients with type II diabetes mellitus in the control group

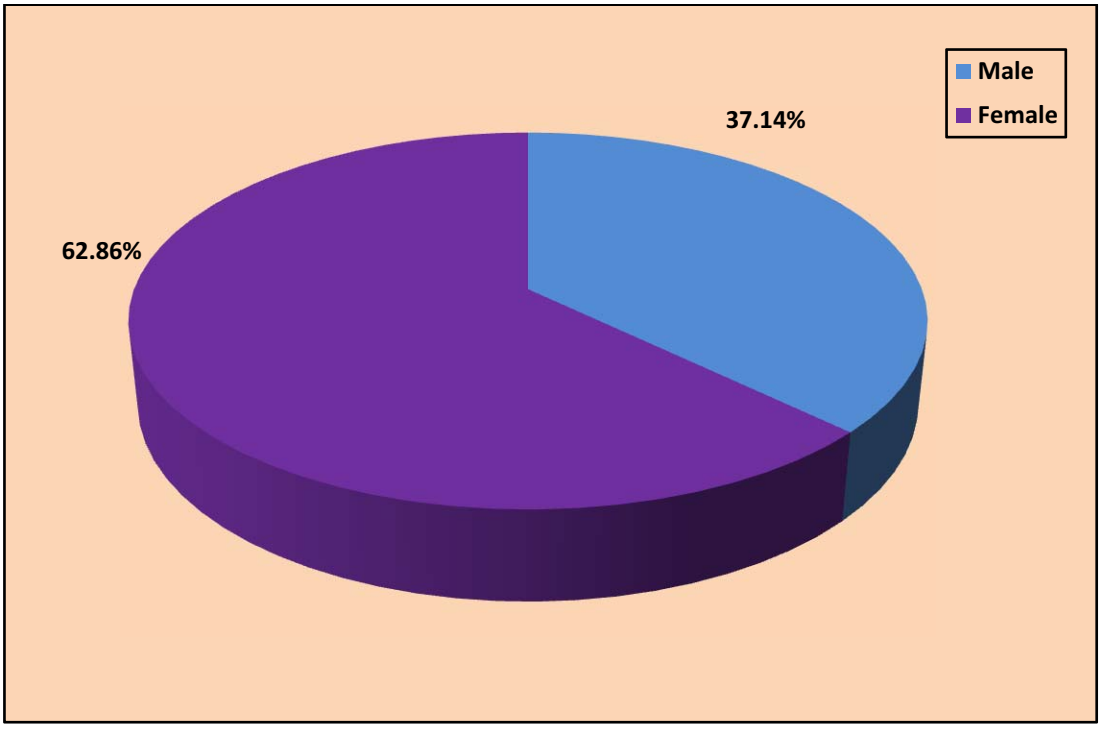

Figure 5: Percentage distribution of gender of clients with type II diabetes mellitus in the experimental group

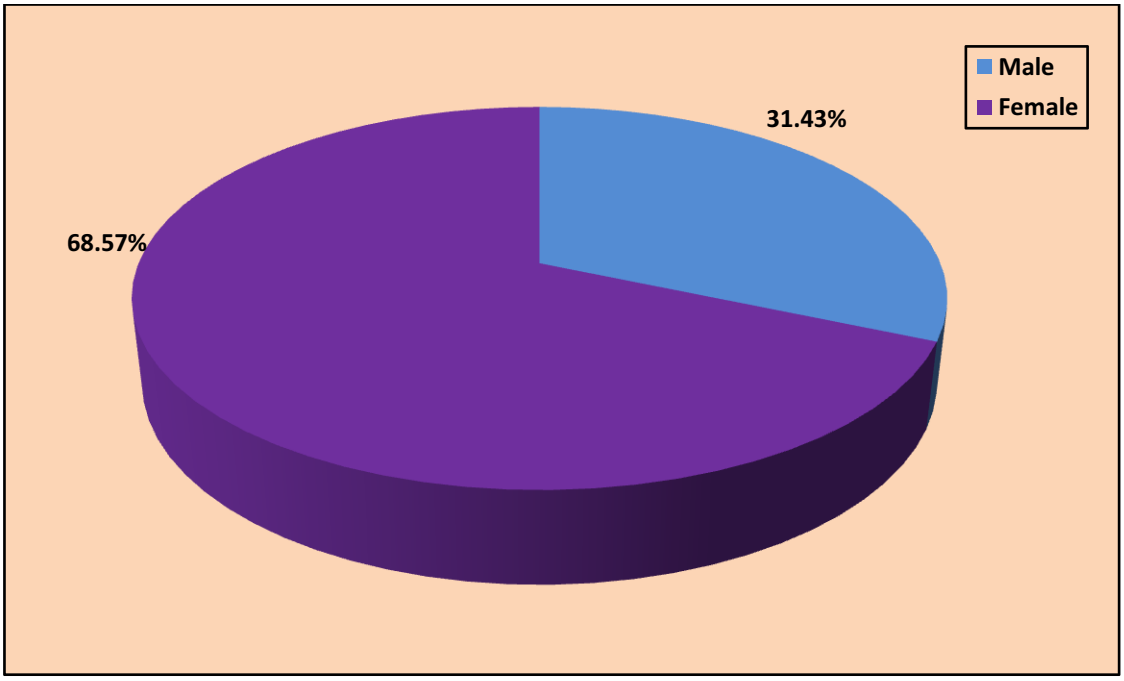

Figure 6: Percentage distribution of gender of clients with type II diabetes mellitus in the control group

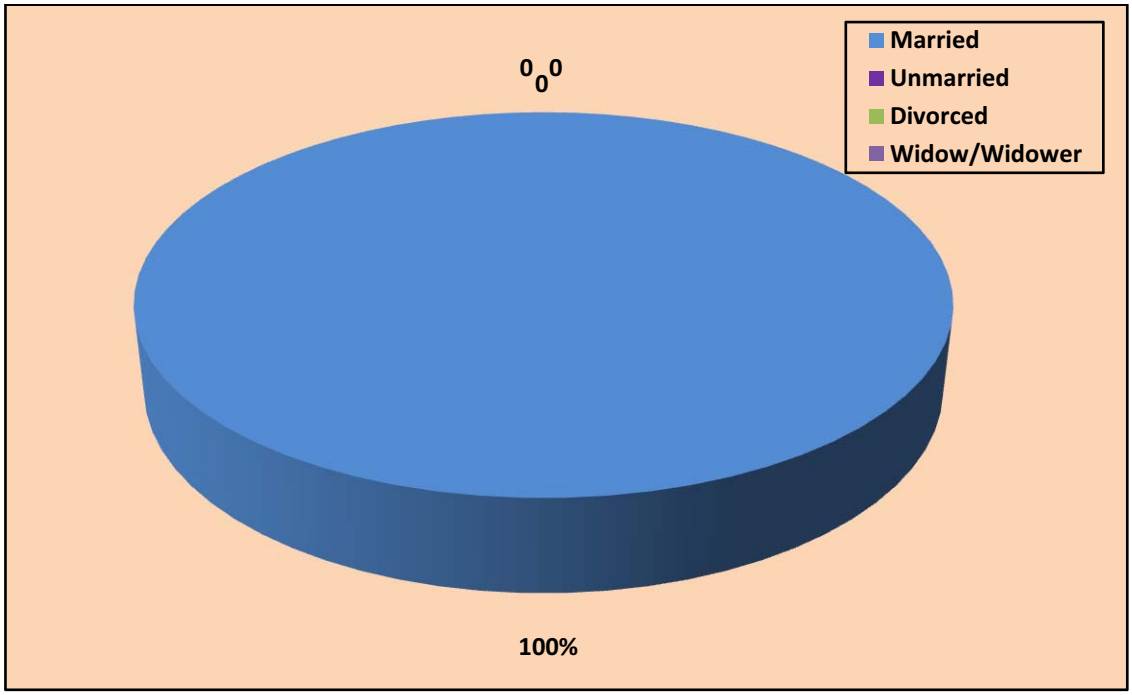

Figure 7: Percentage distribution of marital status of clients with type II diabetes mellitus in the experimental group

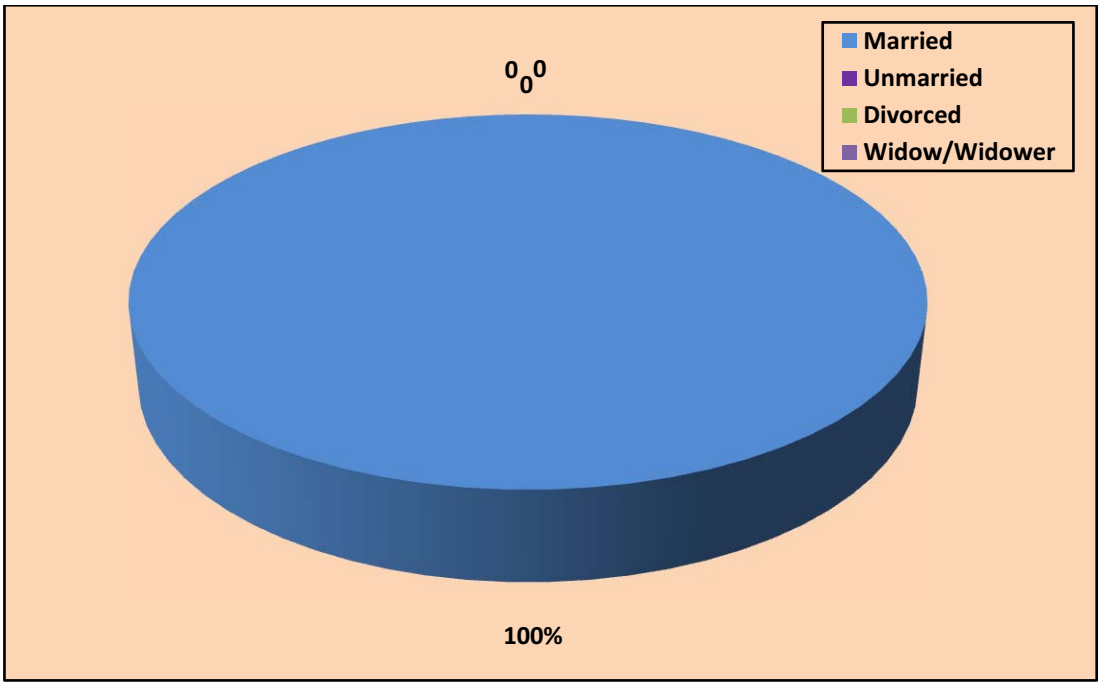

Figure 8: Percentage distribution of marital status of clients with type II diabetes mellitus in the control group

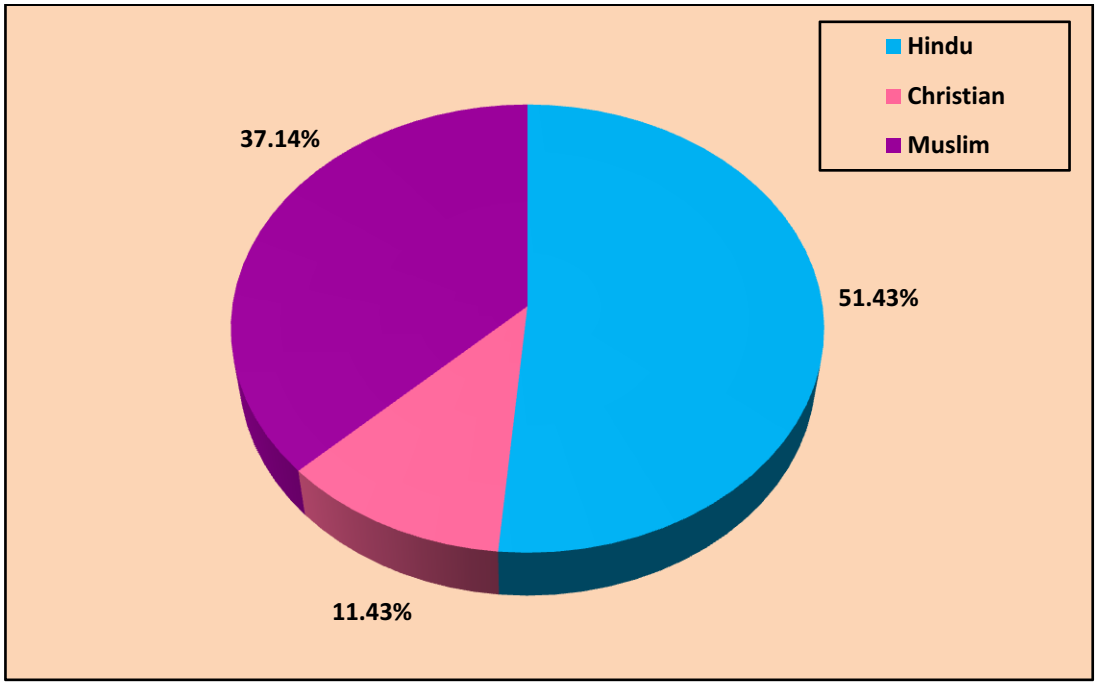

Figure 9: Percentage distribution of religion of clients with type II diabetes mellitus in the experimental group

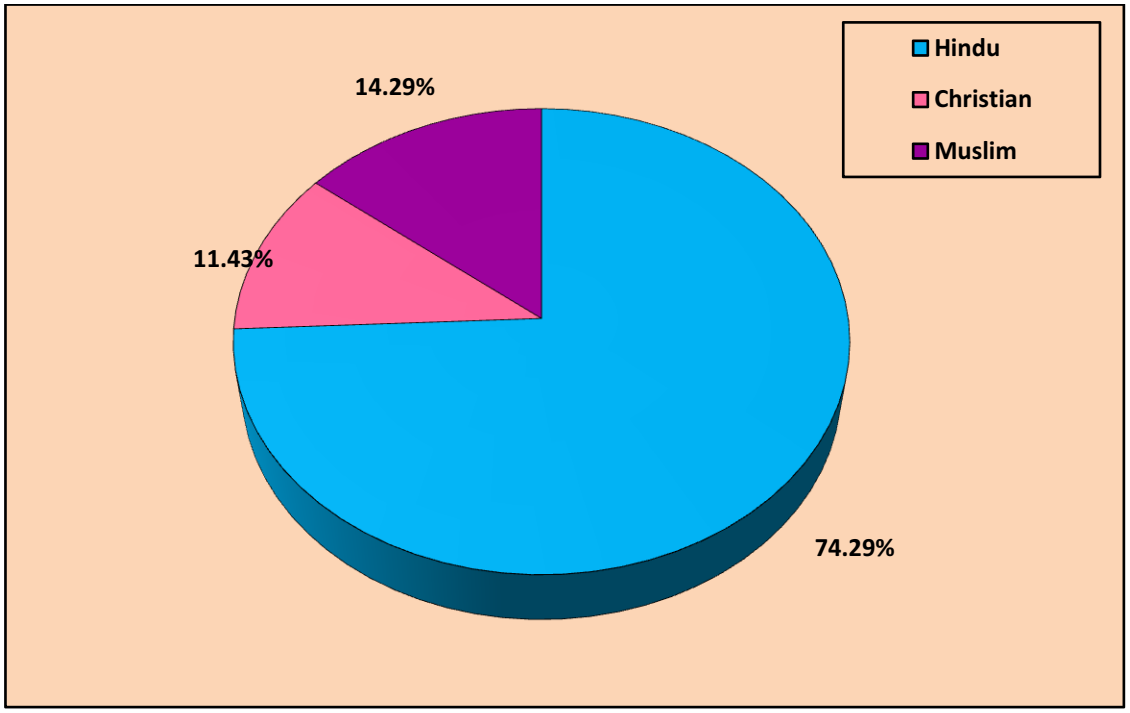

FIGURE 10: Percentage distribution of religion of clients with type II diabetes mellitus in the control group

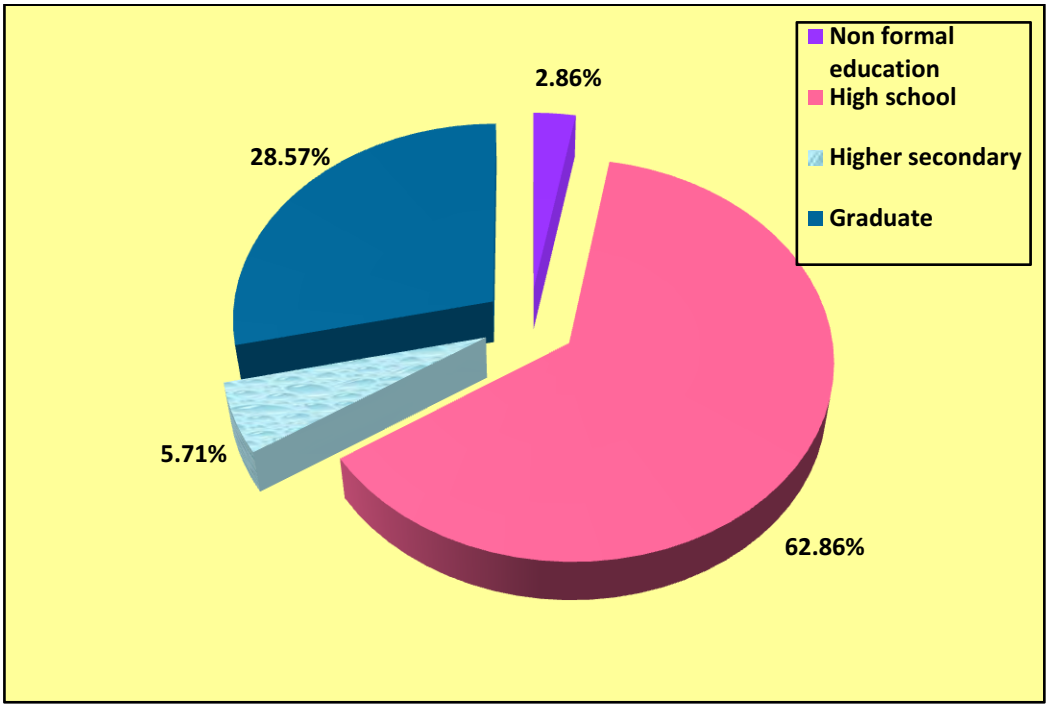

Figure 11: Percentage distribution of educational status of clients with type II diabetes mellitus in the experimental group

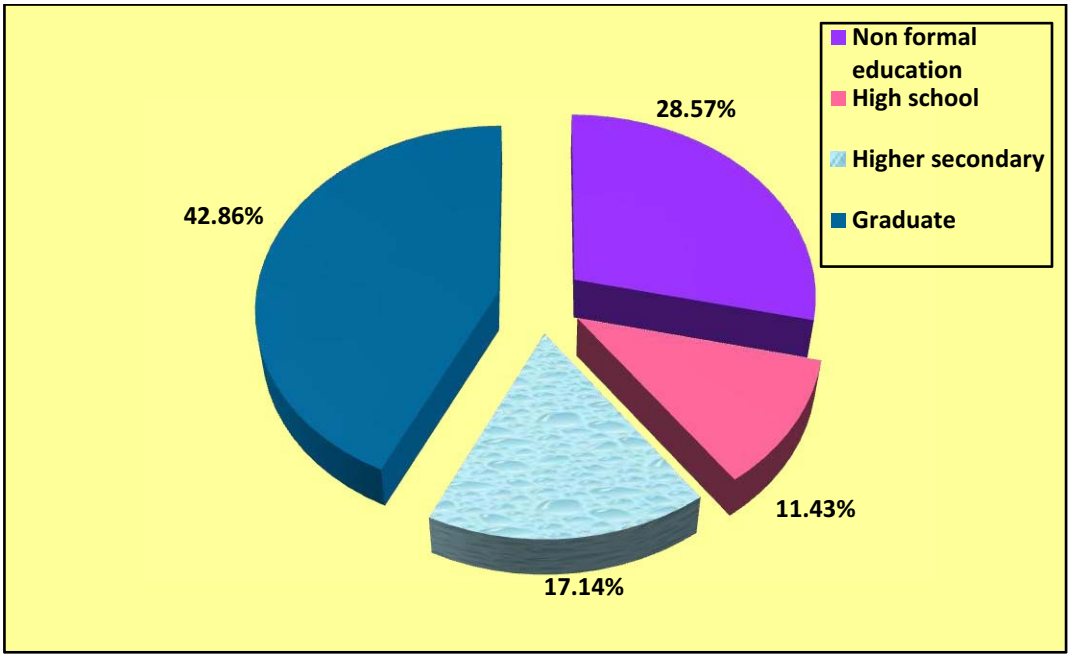

Figure 12: Percentage distribution of educational status of clients with type II diabetes mellitus in the control group

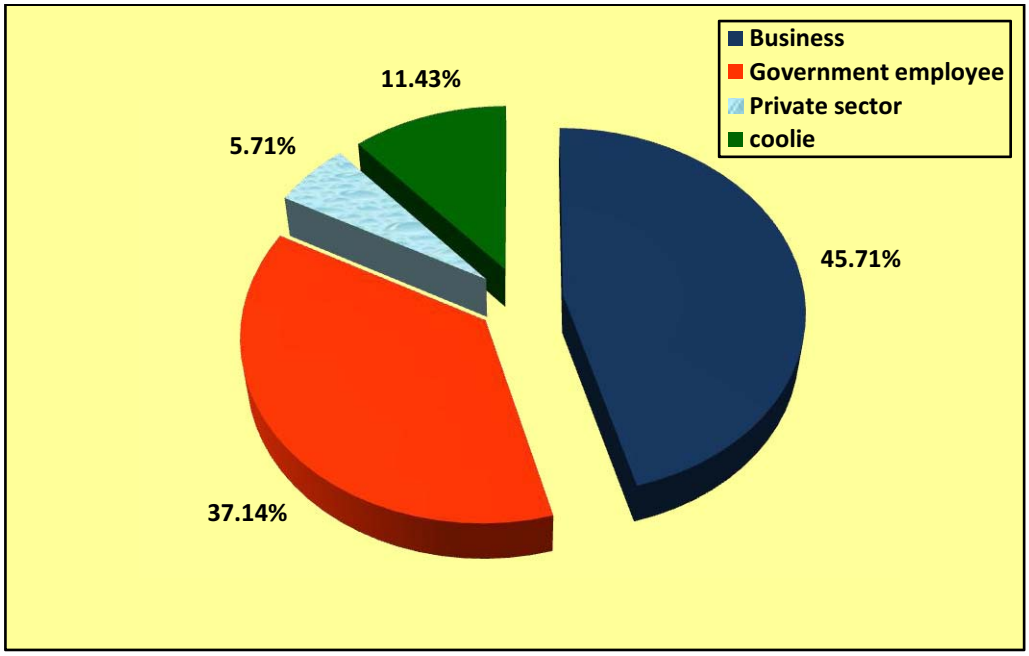

Figure 13 : Percentage distribution of occupation of clients with type II diabetes mellitus in the experimental group

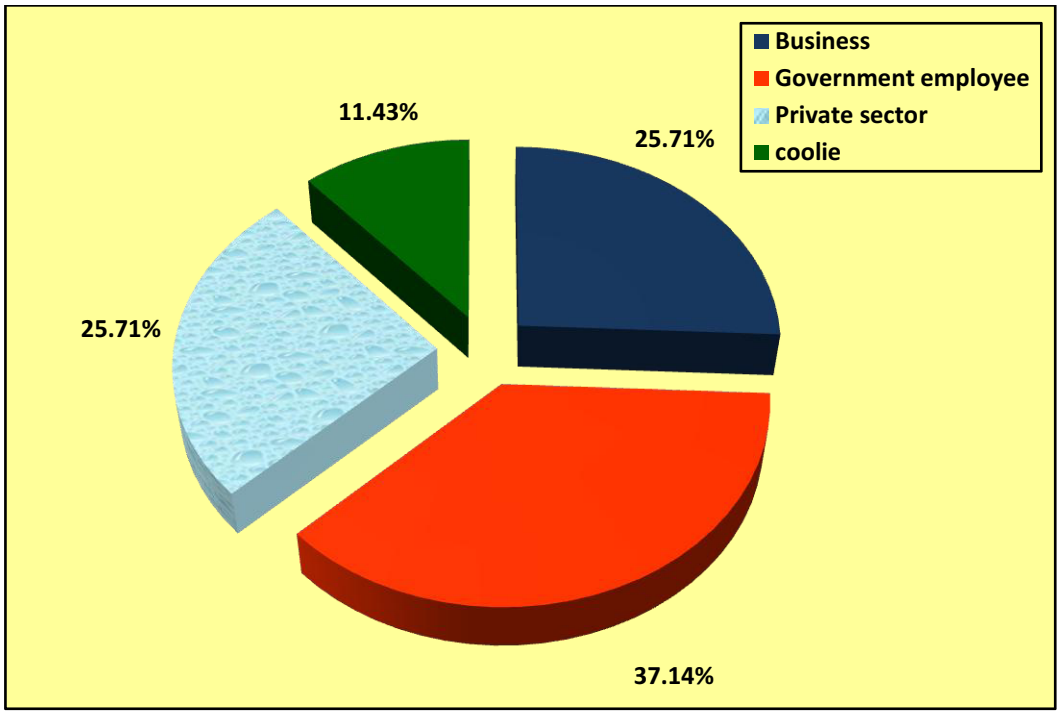

Figure 14: Percentage distribution of occupation of clients with type II diabetes mellitus in the control group

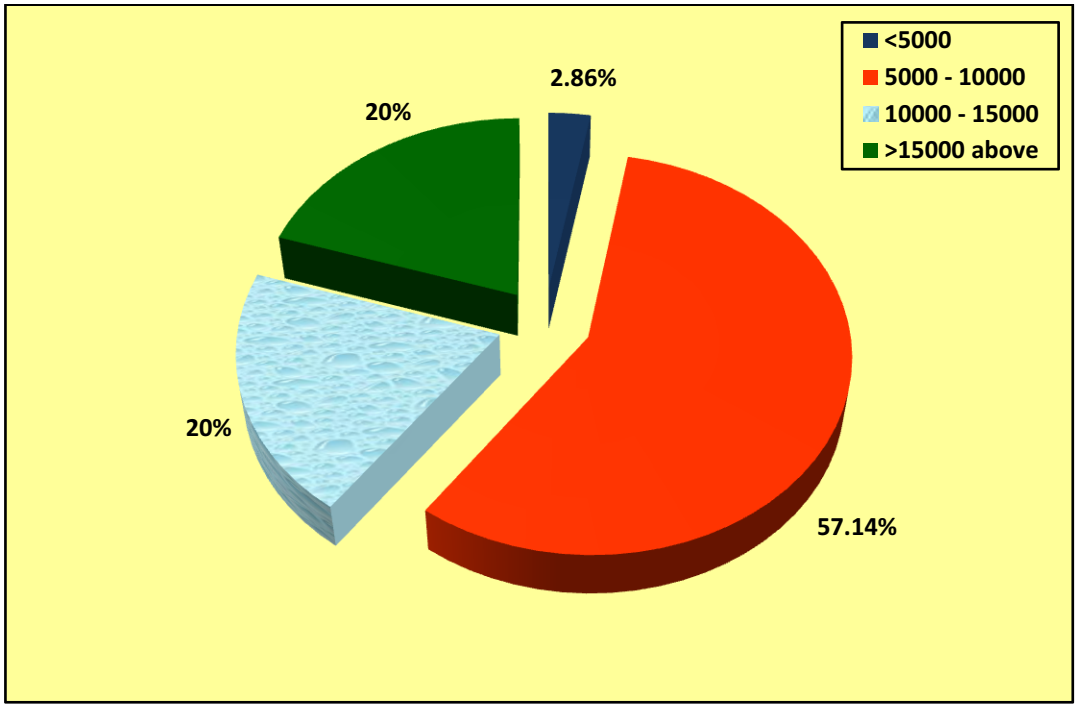

Figure 15:Percentage distribution of monthly income of clients with type II diabetes mellitus in the experimental group

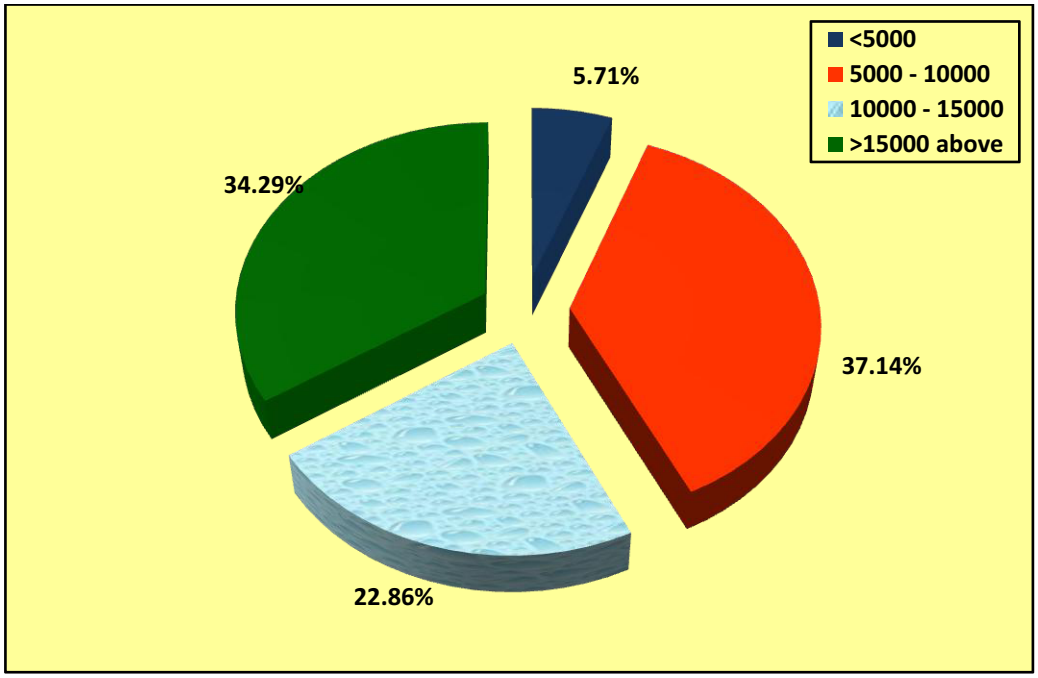

Figure 16: Percentage distribution of monthly income of clients with type II diabetes mellitus in the control group

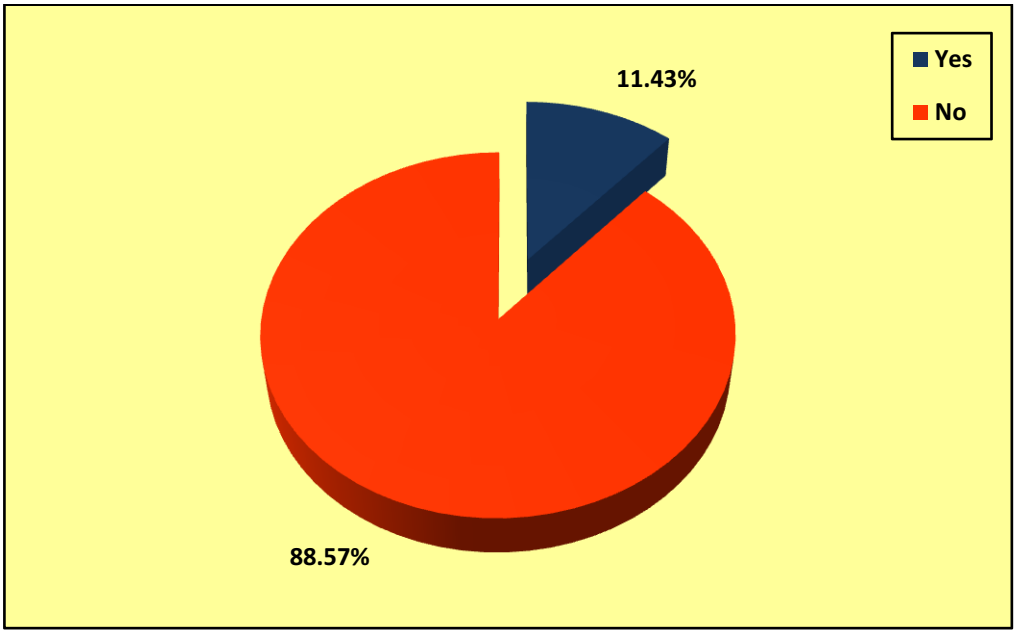

Figure 17: Percentage distribution of following diabetic diet by the clients with type II diabetes mellitus in the experimental group

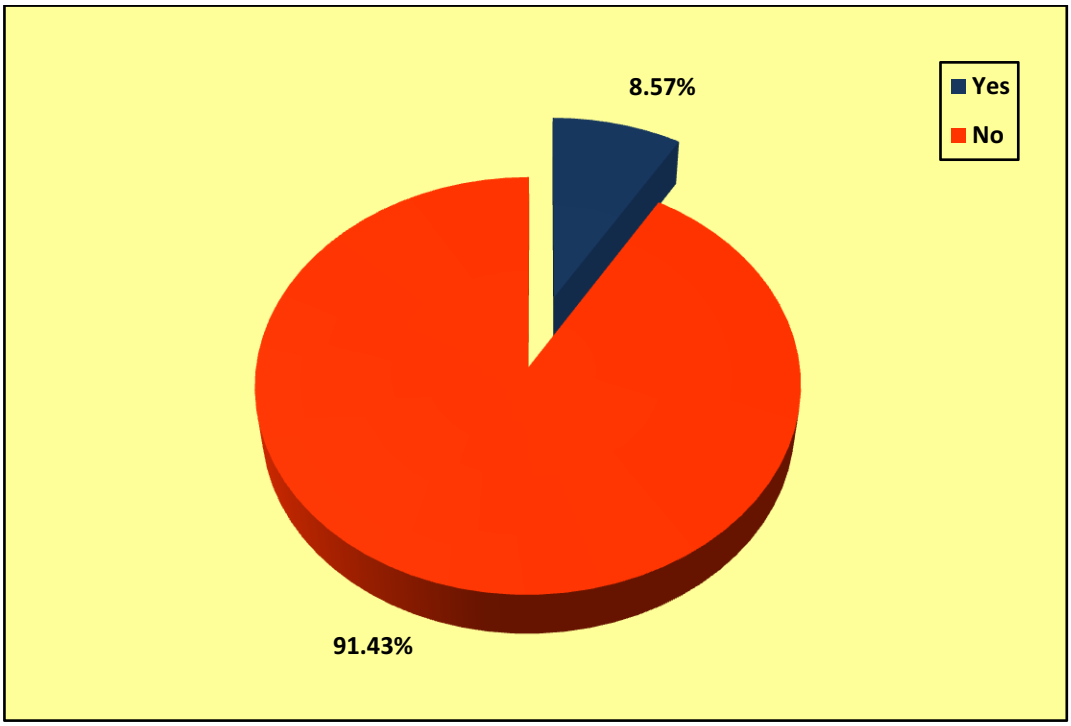

Figure 18: Percentage distribution of following diabetic diet by the clients with type II diabetes mellitus in the control group

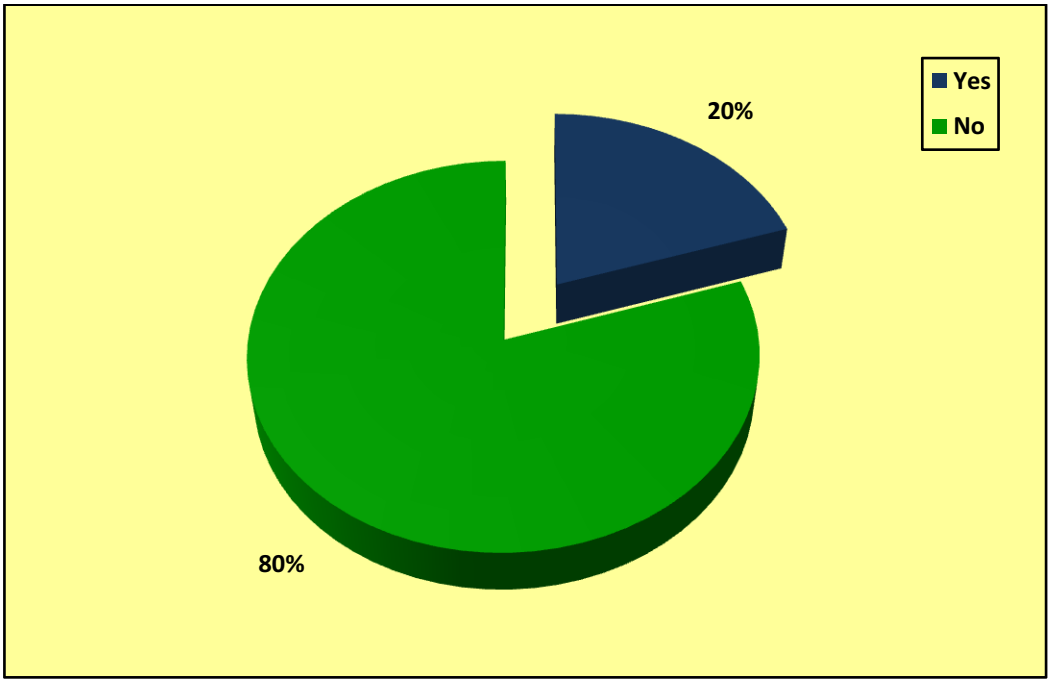

Figure 19 : Percentage distribution of practising regular exercise by the clients with type II diabetes mellitus in the experimental group

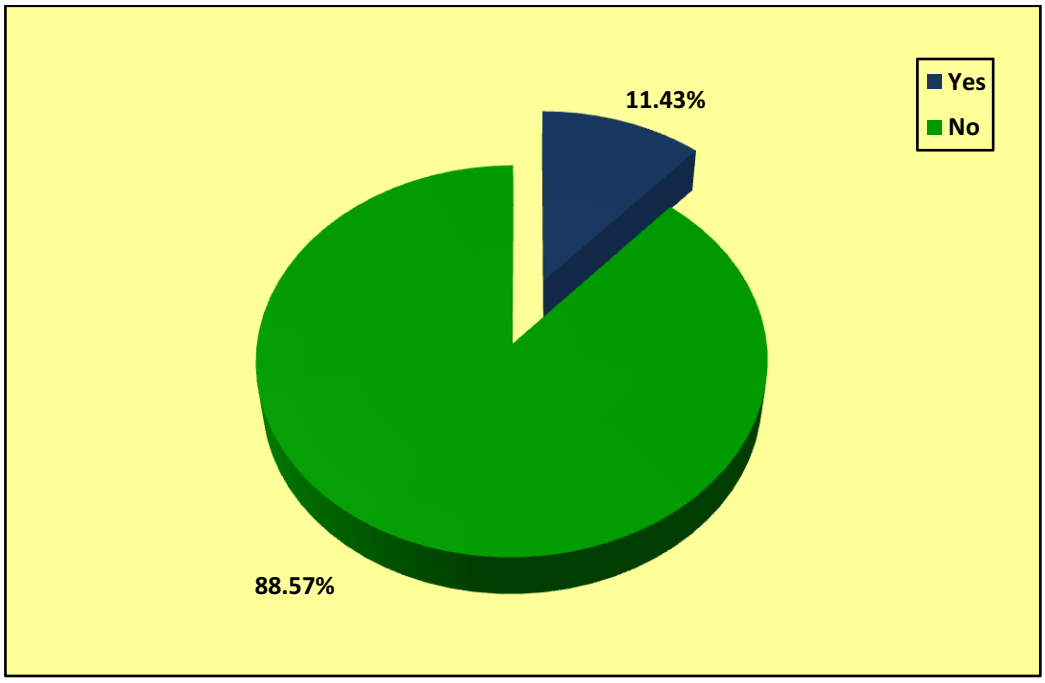

Figure 20: Percentage distribution of practising regular exercise by the clients with type II diabetes mellitus in the control group

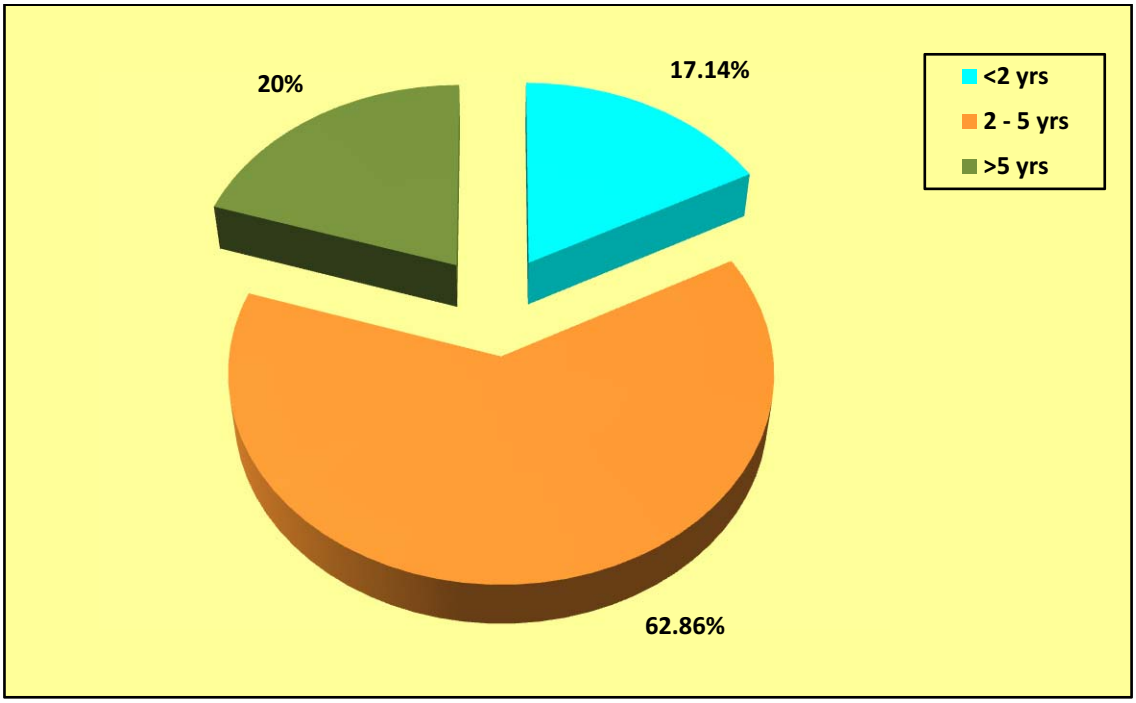

Figure 23: Percentage distribution of duration of illness of clients with type II diabetes mellitus in the experimental group

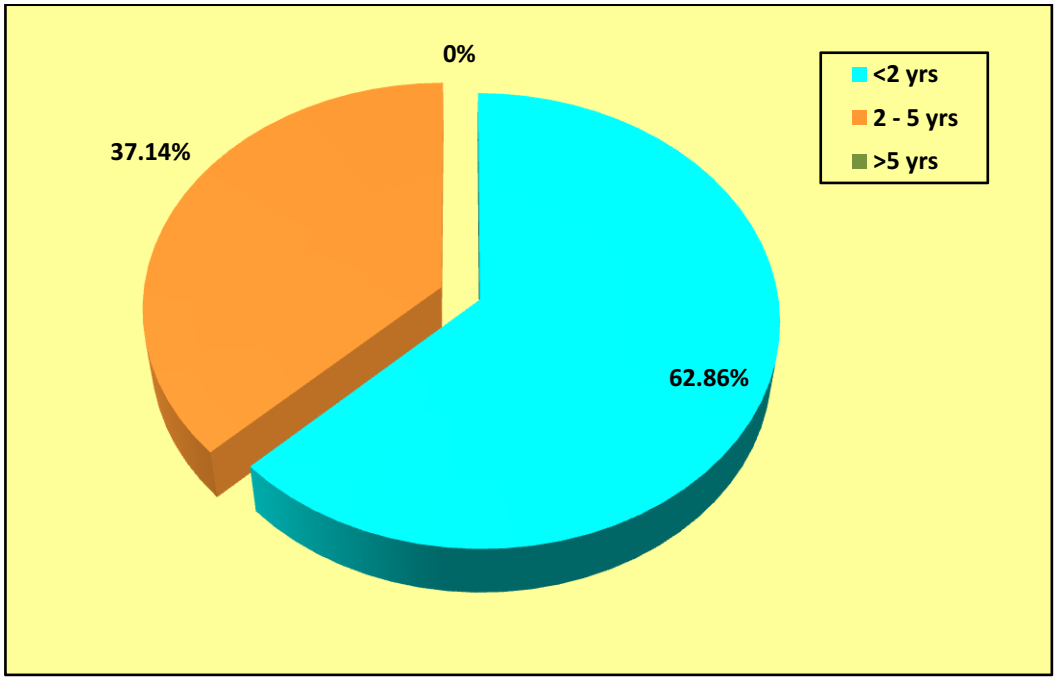

Figure 24: Percentage distribution of duration of illness of clients with type II diabetes mellitus in the control group

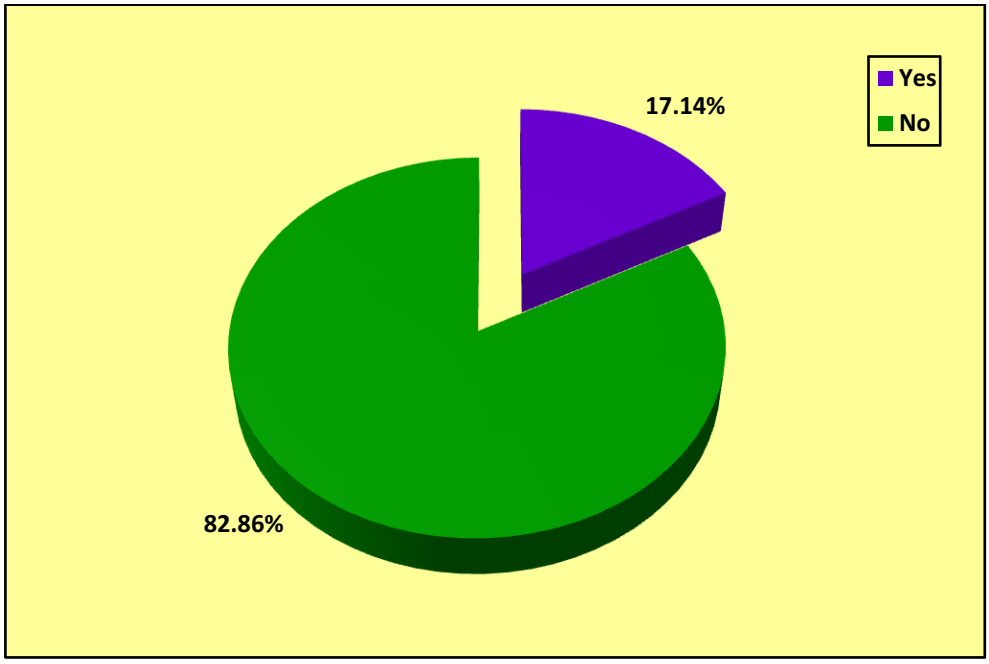

Figure 21: Percentage distribution of family history of diabetes mellitus among clients with type II diabetes mellitus in the experimental group

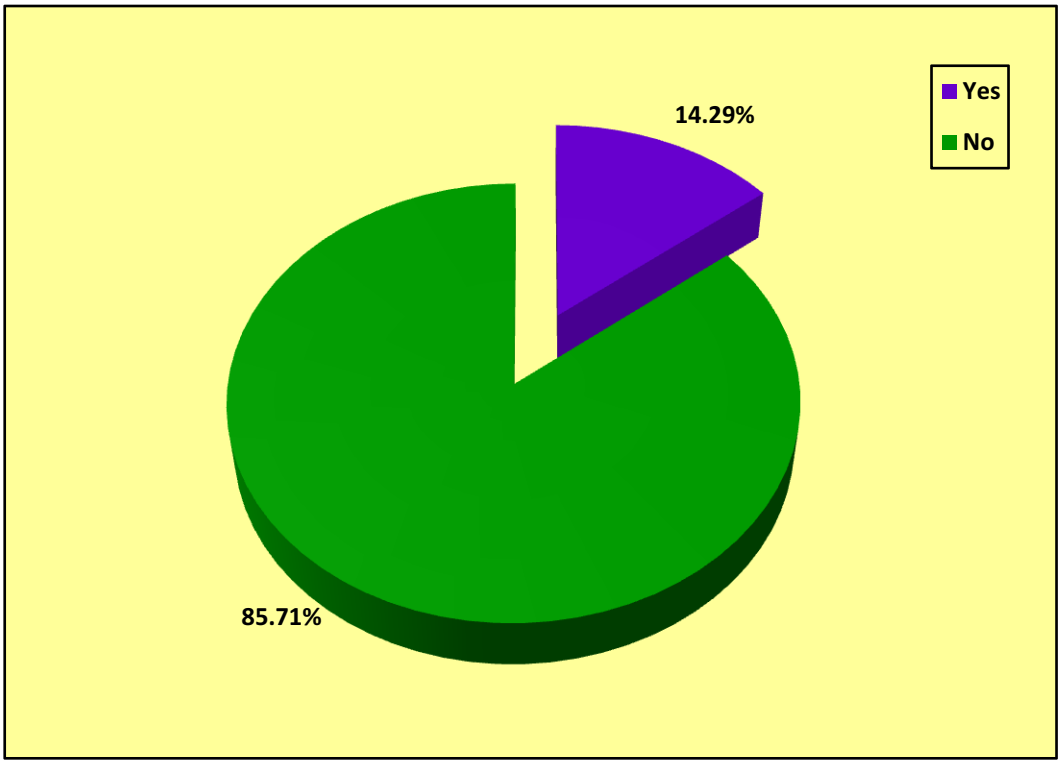

Figure 22: Percentage distribution of family history of diabetes mellitus among clients with type II diabetes mellitus in the control group

SECTION B: ASSESSMENT OF PRETEST AND POSTTEST LEVEL OF FASTING BLOOD GLUCOSE AMONG CLIENTS WITH TYPE II DIABETES MELLITUS IN EXPERIMENTAL AND CONTROL GROUP.

Table 2: Frequency and percentage distribution of pretest and post test level of fasting blood glucose among clients with type II diabetes mellitus in the experimental group.

n=35

Fasting Blood Glucose	Mild (≤140 mg/dl)		Moderate (141 – 165 mg/dl)		Severe (>165 gm/dl)	
	No.	%	No.	%	No.	%
Pretest	6	17.14	7	20.0	22	62.86
Post Test	16	45.71	12	34.29	7	20.0

The table 2 reveals the percentage distribution of pretest and post test level of fasting blood glucose in the experimental group.

The analysis of pretest level of fasting blood glucose in experimental group, revealed that majority 22(62.86%) had severe level of fasting blood glucose, 7(20%) had moderate level of fasting blood glucose and 6(17.14%) had mild level of fasting blood glucose.

Whereas the post test level of fasting blood glucose in experimental group, revealed that 16(45.71%) had mild fasting blood glucose, 12(34.29%) had moderate level of fasting blood glucose and 7(20%) had severe level of fasting blood glucose.

Table 3: Frequency and percentage distribution of pretest and post test level of fasting blood glucose among clients with type II diabetes mellitus in the control group.

n=35

Fasting Blood Glucose	Mild (≤140 mg/dl)		Moderate (141 – 165 mg/dl)		Severe (>165 gm/dl)	
	No.	%	No.	%	No.	%
Pretest	6	17.14	3	8.57	26	74.29
Post Test	7	20.0	5	14.29	23	65.71

The table 3 reveals the percentage distribution of pretest and post test level of fasting blood glucose in the control group.

The analysis of pretest level of fasting blood glucose in experimental group, revealed that majority 26(74.29%) had severe level of fasting blood glucose, 6(17.14%) had mild level of fasting blood glucose and 3(8.57%) had moderate level of fasting blood glucose.

Whereas the post test level of fasting blood glucose in control group, revealed that 23(65.71%) had severe level of fasting blood glucose, 7(20%) had mild level of fasting blood glucose and 5(14.29%) had moderate level of fasting blood glucose.

n=(35+35)70

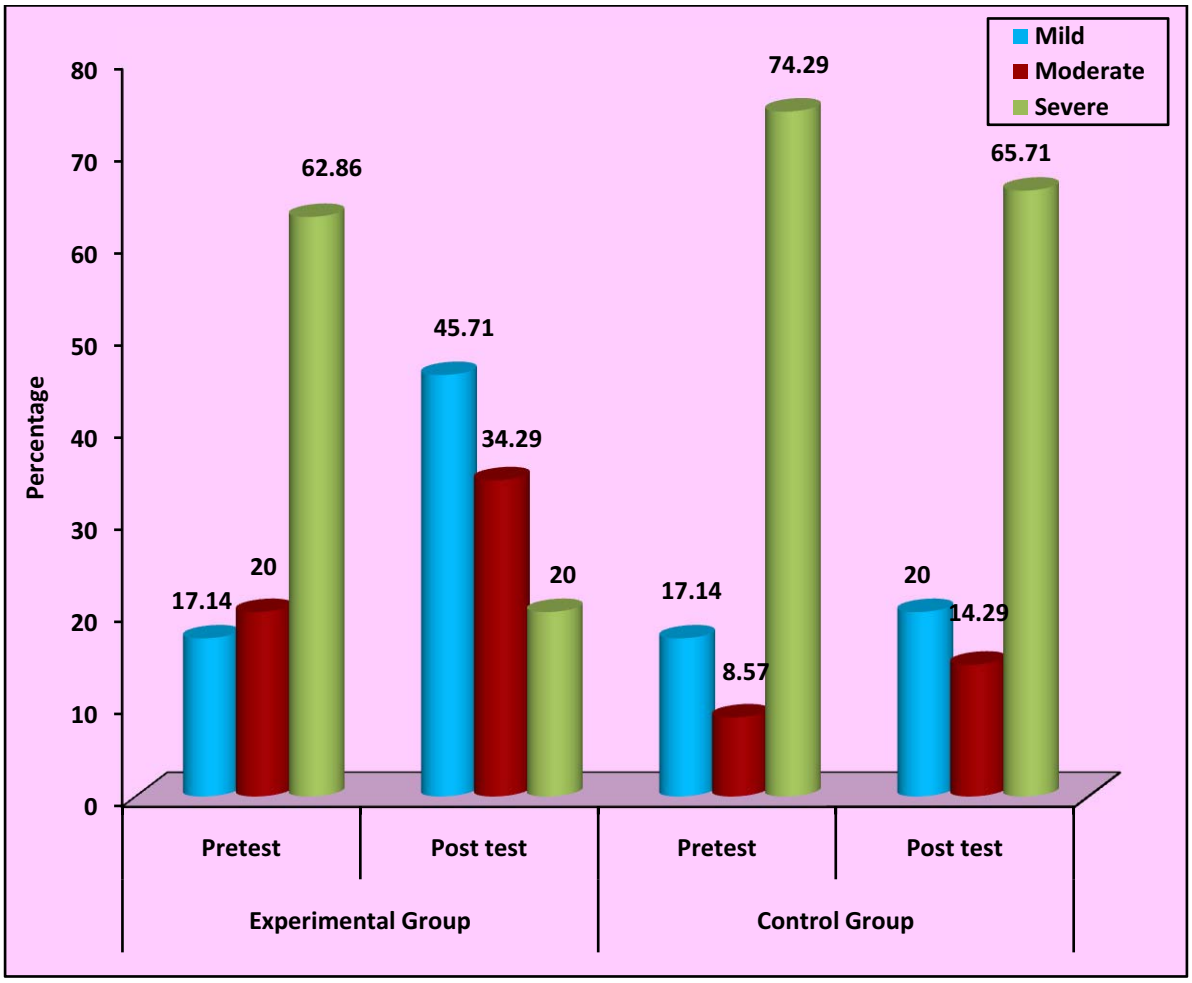

Figure 25: Percentage distribution of pre and post test level of fasting blood glucose in experimental and control group

SECTIONC: COMPARISON OF PRETEST AND POSTTEST LEVEL OF FASTING BLOOD GLUCOSE AMONG CLIENTS WITH TYPE II DIABETES MELLITUS IN EXPERIMENTAL AND CONTROL GROUP.

Table 4: Comparison of pre and post test level of fasting blood glucose score among clients with type II diabetes mellitus in experimental group.

n=35

Fasting Blood Glucose	Mean	S.D	Paired 't' Value
Pretest	181.48	54.21	t = 9.263***
Post Test	154.65	52.50	p = 0.000, S

***p<0.001, S – Significant

The table 4 shows the comparison of pre and post test level of fasting blood glucose among clients with type II diabetes mellitus in experimental group.

The pretest mean value of fasting blood glucose was 181.48 with S.D 54.21 and the post test mean value of fasting blood glucose was 154.65 with S.D 52.50.

The calculated paired 't' value of t = 9.263 was found to be statistically significant at p<0.001 level.

This clearly shows that the administration of roasted fenugreek seed powder on blood glucose among clients with type II diabetes mellitus had significant reduction in their post test level of fasting blood glucose among clients with type II diabetes mellitus in experimental group.

Table 5: Comparison of pre and post test level of fasting blood glucose score among clients with type II diabetes mellitus in control group.

n=35

Fasting Blood Glucuse	Mean	S.D	Paired 't' Value
Pretest	181.54	40.14	t = 0.828
Post Test	178.51	41.56	p = 0.413, N.S

N.S – Not Significant

The table 5 shows the comparison of pre and post test level of fasting blood glucose among clients with type II diabetes mellitus in control group.

The pretest mean value of fasting blood glucose was 181.54 with S.D 40.14 and the post test mean value of fasting blood glucose was 178.51 with S.D 41.56.

The calculated paired 't' value of t = 0.828 was not found to be statistically significant

This clearly shows that there was no significant change between the pretest and post test fasting blood glucose score among clients with type II diabetes mellitus in the control group.

Table 6: Comparison of post test level of fasting blood glucose score among clients with type II diabetes mellitus between the experimental and control group.

n=70(35+35)

Post Test	Mean	S.D	Unpaired 't' Value
Experimental	154.65	52.50	t = 2.108
Control	178.51	41.56	p = 0.039, S*

*p<0.05, S – Significant

Table 6 shows the comparison of post test fasting blood glucose score between the experimental and control group.

When comparing the post test fasting blood glucose score between the experimental and control group, the post test mean score in the experimental group was 154.65 with S.D 52.50 and the post test mean score in the control group was 178.51 with S.D 41.56. The calculated unpaired 't' value of t = 2.108 was found to be statistically significant at p<0.05 level.

This clearly indicates that after the administration of roasted fenugreek seed powder on blood glucose among clients had significant reduction in their post test level of fasting blood glucose among clients with type II diabetes mellitus in experimental group than the clients with type II diabetes mellitus in the control group.

SECTION D: ASSOCIATION OF POSTTEST LEVEL OF FASTING BLOOD GLUCOSE AMONG CLIENTS WITH TYPE II DIABETES MELLITUS WITH SELECTED DEMOGRAPHIC VARIABLES.

Table 7: Associations of post test level of fasting blood glucose among clients with type II diabetes mellitus with their selected demographic variables in experimental group.

n=35

Demographic Variables	Mild (115-140 mg/dl)		Moderate (141 – 165 mg/dl)		Severe (>165 gm/dl)		Chi-Square Value
	No.	%	No.	%	No.	%	
Age in years							$\chi^2 = 3.148$
31 - 40 yrs	2	5.7	0	0	1	2.9	d.f = 4
41 - 50 yrs	8	22.9	9	25.7	3	9.6	p = 0.534
51 - 60 yrs	6	17.1	3	8.6	3	9.6	N.S
Gender							$\chi^2 = 0.326$
Male	6	17.1	5	14.3	2	5.7	d.f = 2
Female	10	28.6	7	20.0	5	14.3	p = 0.849 N.S
Marital status							
Married	16	45.7	12	34.3	7	20.0	
Unmarried	-	-	-	-	-	-	-
Divorced	-	-	-	-	-	-	
Widow/Widower	-	-	-	-	-	-	
Religion							$\chi^2 = 3.264$
Hindu	6	17.1	7	20.0	5	14.3	d.f = 4
Christian	3	8.6	1	2.9	0	0	p = 0.512
Muslim	7	20.0	4	11.4	2	5.7	N.S

Demographic Variables	Mild (115-140 mg/dl)		Moderate (141 – 165 mg/dl)		Severe (>165 gm/dl)		Chi-Square Value
Educational status							$\chi^2 = 7.913$
Non formal education	0	0	1	2.9	0	0	d.f = 6
High school	11	31.4	5	14.3	6	17.1	p = 0.245
Higher secondary	0	0	2	5.7	0	0	N.S
Graduate	5	14.3	4	11.4	1	2.9	
Occupation							$\chi^2 = 1.180$
Business	7	20.0	5	14.3	4	11.4	d.f = 6
Government employee	6	17.1	5	14.3	2	5.7	p = 0.978
Private sector	1	2.9	1	2.9	0	0	N.S
Coolie	2	5.7	1	2.9	1	2.9	
Monthly income							$\chi^2 = 3.071$
<5000	1	2.9	0	0	0	0	d.f = 6
5000 - 10000	8	22.9	8	22.9	4	11.4	p = 0.800
10000 - 15000	4	11.4	1	2.9	2	5.7	N.S
>15000 above	3	8.6	3	8.6	1	2.9	
Following diabetic diet							$\chi^2 = 1.864$
Yes	3	8.6	1	2.9	0	0	d.f = 2
No	13	37.1	11	31.4	7	20.0	p = 0.394 N.S
Practising regular exercise							$\chi^2 = 0.476$
Yes	4	11.4	2	5.7	1	2.9	d.f = 2
No	12	34.3	10	28.6	6	17.1	p = 0.788 N.S
							$\chi^2 = 10.360$

Demographic Variables	Mild (115-140 mg/dl)		Moderate (141 – 165 mg/dl)		Severe (>165 gm/dl)		Chi-Square Value
Duration of illness							d.f = 4
<2 yrs	5	14.3	1	2.9	0	0	p = 0.035
2 - 5 yrs	11	31.4	6	17.1	5	14.3	S*
>5 yrs	0	0	5	14.3	2	5.7	
Do you have any family history of diabetes mellitus							$\chi^2 = 1.328$ d.f = 2 p = 0.515 N.S
Yes	3	8.6	1	2.9	2	5.7	
No	13	37.1	11	31.4	5	14.3	

*p<0.05, S – Significant, N.S – Not Significant

The table 7 shows that the demographic variable duration of illness had shown statistically significant association with post test level of fasting blood glucose at p<0.05 level among clients with type II diabetes mellitus in the experimental group and the other demographic variables had not shown statistically significant association with the post test level of fasting blood glucose among clients with diabetes mellitus in the experimental group.

CHAPTER-V
DISCUSSION

Diabetes mellitus (DM) is probably one of the oldest disease known to man. People living with type II diabetes mellitus are more vulnerable to various forms of both short and long term complications, which often lead to their premature death. This tendency of increased morbidity and mortality is seen in patients with type II diabetes mellitus.

It is predicted that the prevalence of diabetes mellitus in adults of which type II diabetes mellitus is becoming prominent will increase in the next two decades and much of the increase will occur in developing countries where the majority of patients are aged between 45 and 64 years.

The present study was conducted to evaluate the effectiveness of roasted fenugreek seed powder for type II diabetes mellitus among 70 diabetes mellitus at Kamarajapuram, Pudukkottai.

This chapter discussed the major findings of the study and reviews them in terms of result from other studies.

The first objective of the study was to assess the pretest level of fasting blood glucose among type II diabetes mellitus before providing roasted fenugreek seed powder in experimental and control group. The level of fasting blood glucose was assessed through glucometer.

The investigator concluded that the experimental type II diabetes mellitus clients had 6(17.14%) mild,7(20%) moderate and 22(62.86%) severe fasting blood glucose level. In control group, type II diabetes mellitus had 6(17.14%) mild,3(8.57%) and severe 26(74.29%) fasting blood glucose level.

These findings were supported by Ms. Anjali Deshmukh (2008), who stated that type II diabetes mellitus of experimental group had mild, moderate and severe fasting blood glucose level, the control group of type II diabetes mellitus had moderate and severe fasting blood glucose level.

The second objective of the study was to assess the post test level of fasting blood glucose among type II diabetes mellitus before providing roasted fenugreek seed powder in experimental and control group.

The investigator concluded that the experimental type II diabetes mellitus clients had 16(45.71%) mild, 12(34.29%) moderate and 7(20%) severe fasting blood glucose level. In control group, type II diabetes mellitus had 7(20%) mild,5(14.29) moderate and 23(65.71%) fasting blood glucose level.

The investigator found that control group type II diabetes mellitus clients did not consume roasted fenugreek seed powder. The stated hypotheses 1 was accepted.

These findings were supported by Mrs.Rashmi Srinivasta (2010),who stated that the experimental group of type II diabetes mellitus had mild and moderate level of fasting blood glucose level and control group of type II diabetes mellitus had severe and moderate level of fasting blood glucose.

The third objective of the study was to evaluate the effectiveness of roasted fenugreek seed powder on fasting blood glucose level among clients with type II diabetes mellitus in the experimental group.

The pretest mean score of fasting blood glucose was 181.48 with S.D 54.21 and the post test mean score of fasting blood glucose was 154.65 with S.D 52.50 the calculated paired “t” test values of t=9.263 was found to be statistically significant $p<0.001$ level. This clearly indicated that the roasted fenugreek seed powder

administered to the type II diabetes mellitus in the experimental group resulted in the considerably reduce the fasting blood glucose level.

The pretest mean score of fasting blood glucose was 181.54 with S.D 40.14 and the post test mean score of fasting blood glucose was 178.51 with S.D 41.56 the calculated paired " t" test values of t=0.828 was not found to be statistically significant there is no change in the level of fasting blood glucose level among type II diabetes mellitus in the control group.

Comparison of post test fasting blood glucose among type II diabetes mellitus between the experimental and control group. The post test mean score of fasting blood glucose was 154.65 with S.D 52.50 in the experimental group and the post test of fasting blood glucose was 178.51 with S.D 41.56 in the control group.The calculated unpaired "t" test value of t=2.108 was found to be statistically significant at $p<0.05$ level. The roasted fenugreek seeds administered to the type II diabetes mellitus in the experimental group had significant effect in the post test level of fasting blood glucose than the control group.

These findings were supported by Mr.Prashant V. Pandey who stated the roasted fenugreek seed powder helps to reduce blood glucose level of type II diabetes mellitus in experimental group. In control group there is no changes in the blood glucose level

The fourth objective of this study was to find out the association between the post test level of fasting blood glucose level with their selected demographic variables in experimental group.

The chi square value showed significance association between the roasted fenugreek seed powder to type II diabetes mellitus. Demographic variables such as duration of illness had shown statistically significance association with the post test level of fasting blood glucose among type II diabetes mellitus at $p<0.05$ level. The

other demographic variable had not shown statistically significance association with the post test level of fasting blood glucose among type II diabetes mellitus in the experimental group. The stated hypotheses 4 was accepted.

These findings were supported by Mrs.Ezhilarasi.R (2008) who stated that the demographic variables, duration of illness was significantly associated with the post test level of fasting blood glucose among type II diabetes mellitus in experimental group.

CHAPTER-VI

SUMMARY, CONCLUSION, IMPLICATIONS, LIMITATIONS AND RECOMMENDATIONS

This chapter presents the summary of the study and conclusion drawn. It classifies limitation of the study**,** implications, recommendations in different areas like nursing practice, nursing education, nursing administration, nursing research and recommendation for the further study.

SUMMARY OF THE STUDY:

"A quasi experimental study to evaluate the effectiveness of roasted fenugreek seed powder on blood glucose among clients with type II diabetes mellitus in urban community health centre at kamarajapuram,Pudukkottai**,** during the year 2015"

THE FOLLOWING OBJECTIVES WERE SET FOR THE STUDY:

1. To assess the pre test level of fasting blood glucose among clients with type II diabetes mellitus in experimental group and control group.
2. To assess the post test level of fasting blood glucose among clients with type II diabetes mellitus in experimental group and control group
3. To evaluate the effectiveness of roasted fenugreek seed powder on level of fasting blood glucose among clients with type II diabetes mellitus in the experimental group.
4. To find out the association between the post test level of fasting blood glucose with their selected demographic variables in experimental group.

HYPOTHESES:

H1- The mean post test level of fasting blood glucose level would be significantly lower than the pre test level of fasting blood glucose in experimental group.

H2 – The mean post test level of fasting blood glucose in experimental group would be significantly lower than the post test level of fasting blood glucose in control group.

H3- There was a significant effectiveness of roasted fenugreek powder on fasting blood glucose level among clients with type II diabetes mellitus in experimental group.

H4-There was a significant association between the post test level of fasting blood glucose with their selected demographic variables among clients with type II diabetes mellitus in experimental group.

The conceptual model of the study was based on the **J. M. KENNY'S OPEN SYSTEM MODEL.** The study was conducted by quasi experimental with pretest – post test control group design. purposive sampling was used to select the study sample. The instrument used for data collection were glucometer.

The data analyzed and interpreted in terms of objectives and research hypothesis. Descriptive statistics [FREQUENCY, PERCENTAGE, MEAN AND STANDARD DEVIATION] and inferential statistics [paired and unpaired " t" test] and chi square were used to test the research hypotheses.

MAJOR FINDINGS OF THE STUDY:

1. In the experimental group, the majority 20(57.14%) were in the age of 41-50 years,12(34.29%) were in the age group of 51-60 years, 3(8.57%) were in the age group of 31-40 years ;sex, the majority 22(62.86%) were female and 13(37.14%) were male; almost all were married and the majority 35(100%).religion, the majority 18(51.43%) were Hindu, 13(37.14%) were Muslim and 4(11.43%) were Christian; Considering the educational status the majority 22(62.86%) were high school,10(28.57%) were graduate, 2(5.71%) were higher secondary, 1(2.86%) were Non formal education. Occupation reveals that the majority were 16(45.71%) were business,13(37.14%) were government employee, 4(11.43%) were coolie,2(5.71%) were in private sector; monthly income of 5000-10000 were 20(57.14%), 10000-15000 were 7(20%), >15000 were 7(20%) and <5000 were 1(2.86%); the persons not following diabetic diet that the majority were 31(88.57%) and following diabetic diet were 4(11.43%); persons not practising regular exercise were 28(80%) and the persons practising regular exercise were 7(20%); The duration of illness revealed that the majority 2-5 years were 22(62.86%), >5 years were 7(20%) and <2 years were 6(17.14%); persons not following diabetic diet were 29(82.86%) and persons following diabetic diet were 6(17.14%)

2. In the control group, majority 25(71.43%) were in the age group of 41 – 50 years, 9(25.71%) were in the age group of 51-60 years and 1(2.86%); 24(68.57%) were female and 11(31.43%) were male; almost all 35(100%) were married, 26(74.29%) were Hindus, 5(14.29%) were Muslim and 4(11.43%) were Christians ; The majority of 15(42.86%) were graduates, 10(28.57%) were Non formal education, 6(17.14%) were higher secondary and 4(11.43%) were high school; The majority of 13(37.14%) were government employee, 9(25.71%) were in business ,9(25.71%) were private sector and 4(11.43%) were coolie ; The

majority of 13(37.14%) had monthly income of 5000 – 10000, 12(34.29%) had >15000 income, 8(22.36%) were 10000-15000, <5000 were 2(5.71%); The majority of 32(91.43%) were not following diabetic diet, 3(8.57%) were following diabetic diet; 31(88.57%) were not practicing regular exercise and 4(11.43%) were practising regular exercises; 22(62.86%) were suffering from illness for <2 yrs, 13(37.14%) were between 2-5 years of duration of illness; 30(85.71%) had no family history of diabetes mellitus and 5(14.29%) had family history of diabetes mellitus.

3. The over all pre test level of type II diabetes mellitus shows there the majority 22(62.86%) had severe fasting blood glucose level, 7(20%) had moderate and 6(17.14%) had mild. The overall post test level of type II diabetes mellitus shows there the majority 16(45.71%) had mild, 12(34.29%) were moderate and 7(20%) had severe fasting blood glucose level in experimental group.
4. The over all pre test level of type II diabetes mellitus shows there the majority 26(74.29%) had severe fasting blood glucose level, 6(17.14%) had mild and 3(8.57%) had mild. The overall post test level of type II diabetes mellitus shows there the majority 7(20%) had mild, 5(14.29%) were moderate and 23(65.71%) had severe fasting blood glucose level in experimental group.
5. In the experimental group, the pretest mean score of fasting blood glucose was 181.48 with S.D 54.21 and the post test mean score of fasting blood glucose was 154.65 with S.D 52.50 the calculated paired “t” test values of t=9.263 was found to be statistically significant $p<0.001$ level. This clearly indicated that the roasted fenugreek seed powder administered to the type II diabetes mellitus in the experimental group resulted in the considerably reduce the fasting blood glucose level.

6. The pretest mean score of fasting blood glucose was 181.54 with S.D 40.14 and the post test mean score of fasting blood glucose was 178.51 with S.D 41.56 the calculated paired " t" test values of t=0.828 was not found to be statistically significant there is no change in the level of fasting blood glucose level among type II diabetes mellitus in the control group.
7. The post test mean score of fasting blood glucose was 154.65 with S.D 52.50 in the experimental group and the post test of fasting blood glucose was 178.51 with S.D 41.56 in the control group. The calculated unpaired "t" test value of t=2.108 was found to be statistically significant at $p<0.05$ level. The roasted fenugreek seeds administered to the type II diabetes mellitus in the experimental group had significant effect in the post test level of fasting blood glucose than the control group.
8. Demographic variables duration of illness had shown statistically significance association with the post test level of fasting blood glucose among type II diabetes mellitus at $p<0.05$ level. The other demographic variable had not shown statistically significance association with the post test level of fasting blood glucose among type II diabetes mellitus in the experimental group.

CONCLUSION

1. As for this research is concerned, the interventional study proved that there is a reduction of level of fasting blood glucose among clients with type II diabetes mellitus. The findings of the present study agree with the findings of the previous clinical study, regarding fenugreek powder.
2. The pre-test and post-test mean and standard deviation were calculated. The reduction of level of blood glucose was statistically significant at 0.05 level. Therefore the fenugreek powder is a very effective to reduce the blood glucose level among type II diabetes mellitus clients

NURSING IMPLICATIONS:

1. The findings of the present study supports that, fenugreek is very safe, cost effective and almost is not harmful to health.

2. It is provided to be effective in non pharmacological management to reduce the blood glucose level. The findings of the study have several implications for the following fields.

IMPLICATIONS FOR NURSING PRACTICE:

1. The findings of the study enlighten the fact that fenugreek therapy can be used to maintain the blood glucose of the clients with type II diabetes mellitus.

2. The study findings help the nursing personnel include fenugreek as a nursing intervention in the management of type II diabetes mellitus clients.

3. The nurse should contribute to the evidence based practice through the experience gained from the applications of fenugreek while caring clients with type II diabetes mellitus.

IMPLICATIONS FOR NURSING EDUCATION:

1. The effectiveness of fenugreek in reducing blood glucose is to be published in the nursing journals to make awareness among the nursing students.
2. This study results can be used as an example by the nurse educator in the classroom, when giving instructions regarding the care of clients with type II diabetes mellitus.
3. Nursing students can educate the diabetes mellitus clients to use fenugreek daily in their diet to maintain blood glucose level.
4. Nursing students can enhance their knowledge by including fenugreek as a home remedy in the community health nursing textbooks.

IMPLICATIONS FOR NURSING ADMINISTRATION

1. Nurse administrator can create awareness among community health nurses and enlighten their knowledge about the importance and of fenugreek on type II diabetes mellitus.
2. Nurse administrator can instruct the staff nurses to encourage their diabetes mellitus clients to use fenugreek.

IMPLICATIONS FOR NURSING RESEARCH:

1. Nurse researcher has to conduct the research by comparing the fenugreek with other complementary therapies.
2. Nurse researcher has to conduct the study regarding the effectiveness of fenugreek in type II diabetes mellitus.
3. Nurse researcher can do this study as a comparative study of both in type I and type II diabetic clients.
4. Nurse researcher can do this study with large population to generalize the finding.
5. Nurse researcher can do this study by comparing fenugreek with various home remedies.

LIMITATIONS:

1. **The study was limited to evaluate the effectiveness of roasted fenugreek seed powder only on blood glucose among type II diabetes mellitus clients who were taking oral hypoglycemic drugs.**
2. **The study was limited to the time allotted for administration of roasted fenugreek seed powder(28 days).**

RECOMMENDATIONS

1. The study could be conducted by using large population to generalize the findings.
2. A longitudinal study could be conducted to assess the effectiveness of fenugreek in maintaining blood glucose level.
3. This study could be done in multiple settings.
4. The effectiveness of fenugreek could be tested among clients with diabetes mellitus who are on insulin administration.
5. A follow up study could be done to find out whether the clients are practising fenugreek intake regularly.

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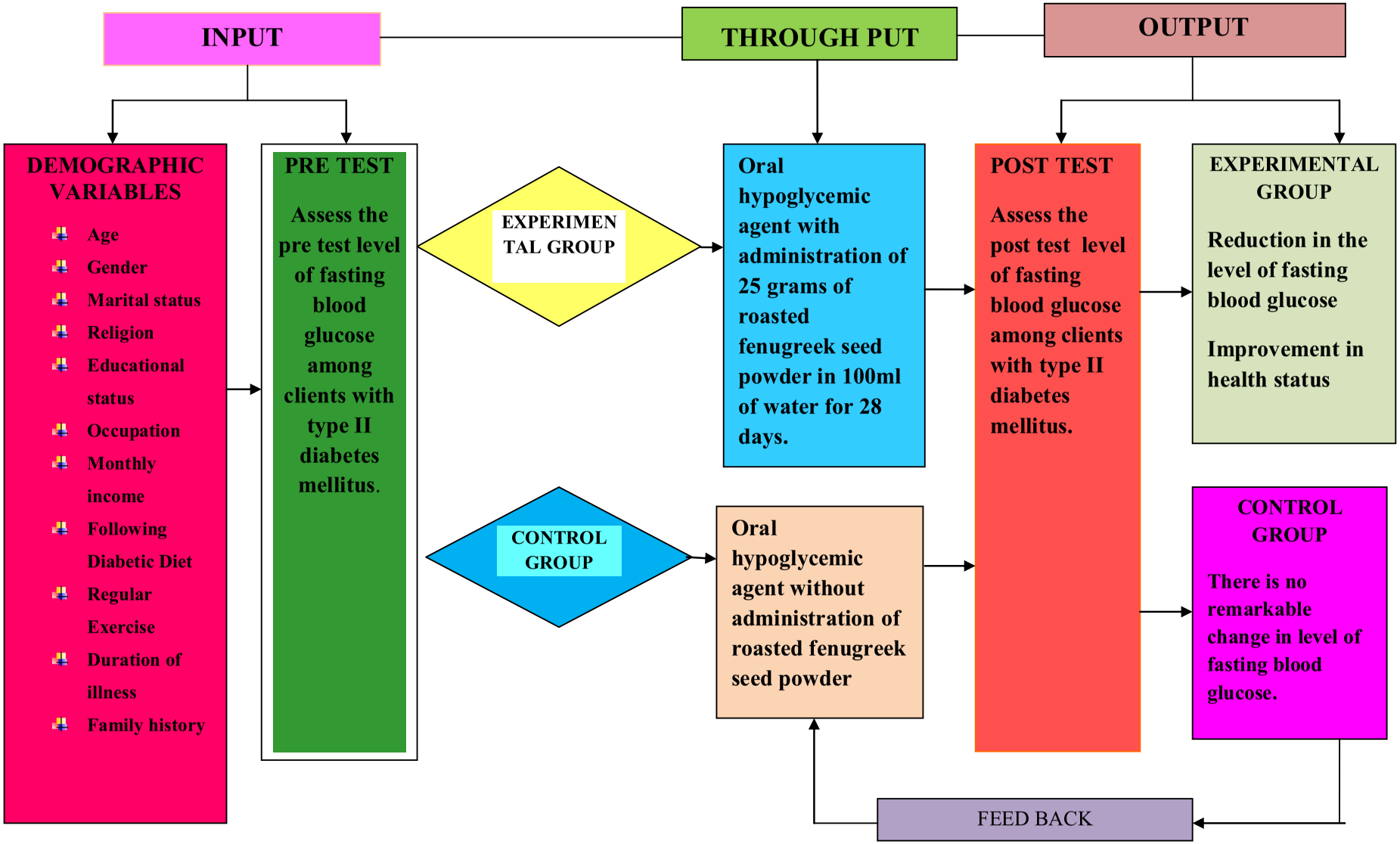

Fig.1 : SCHEMATIC REPRESENTATION OF MODIFIED J. M. KENNY'S OPEN SYSTEM MODEL

DESCRIPTION OF THE TOOL

The tool consists of 2 sections

SECTION A-DEMOGRAPHIC VARIBLE

SECTION B- CLINICAL VARIABLE

SECTION-A

DEMOGRAPHIC VARIABLE:

1. **Age in years**
   a) 31-40 years
   b) 41-50 years
   c) 51-60 years

2. **Gender**
   a) Male
   b) Female

3. **Marital status**
   a) Married
   b) Unmarried
   c) Divorced
   d) Widow/widower

4. **Religion**
   a) Hindu
   b) Christian
   c) Muslim

5. **Educational status**
   a) Non-formal education
   b) High school
   c) Higher secondary
   d) Graduate

6. **Occupation**
   a) Business
   b) Government employee
   c) Private sector d)coolie

7. **Monthly income**
   a) <5000
   b) 5000-10000
   c) 10000-15000
   d) >15000 above

8. **Following Diabetic Diet**
    a) Yes
    b) No
9. **Practising Regular exercise**
    a) Yes
    b) No
10. **Duration of illness**
    a) < 2 years
    b) 2-5 years
    c) >5 years
11. **Do you have any family history of diabetes mellitus**
    a) Yes
    b) No

IF YES, SPECIFY THE RELATIONSHIP

SECTION-B

CLINICAL VARIABLE
BLOOD GLUCOSE ASSESSMENT

VARIABLE:	BEFORE ADMINISTRATION OF ROASTED FENUGREEK SEED POWDER:		AFTER ADMINISTRATION OF ROASTED FENUGREEK SEED POWDER:	
	Date:	Client's Value:	Date:	Client's Value:
EXPERIMENTAL GROUP:				
CONTROL GROUP:				

APPENDIX-C

A) LETTER SEEKING PERMISSION TO CONDUCT THE RESEARCH STUDY

From

Ms.A.PRIYADHARSHINI
M.sc Nursing II Year
Karpaga Vinayaga College of Nursing
Pudukkottai.

To

THE PRINCIPAL
Karpaga Vinayaga College of Nursing
Pudukkottai

Respected madam,

This is for your kind information that,I am Ms.A.Priyadharshini, II Year M.sc Nursing Student of Karpaga Vinayaga College Of Nursing.I would like to conduct a study as a part of partial fulfilment for the degree of masters in nursing.The statement of the problem is" **A STUDY TO EVALUATE THE EFFECTIVENESS OF ROASTED FENUGREEK SEED POWDER ON BLOOD GLUCOSE AMONG CLIENTS WITH TYPE II DIABETES MELLITUS IN URBAN COMMUNITY HEALTH CENTRE, AT KAMARAJAPURAM, PUDUKKOTTAI** during the year 2015"

Thanking you in anticipation

Yours Faithfully,

Place: A.Priyadharshini.

Date:

B) LETTER GRANTING PERMISSION TO CONDUCT THE RESEARCH STUDY

From

Ms.A.PRIYADHARSHINI
M.sc Nursing II Year
Karpaga Vinayaga College of Nursing
Pudukkottai.

To

THE COMMISSIONER
Municipality
Pudukkottai

Through

The principal,
Karpaga vinaya college of nursing
Pudukkottai

Respected sir,

SUB: Requesting permission to conduct the research study, regarding

This is for your kind information that,I am Ms.A.Priyadharshini, II Year M.sc Nursing Student of Karpaga Vinayaga College Of Nursing.I would like to conduct a study as a part of partial fulfilment for the degree of masters in nursing.The statement of the problem is" **A STUDY TO EVALUATE THE EFFECTIVENESS OF ROASTED FENUGREEK SEED POWDER ON BLOOD GLUCOSE AMONG CLIENTS WITH TYPE II DIABETES MELLITUS IN URBAN COMMUNITY HEALTH CENTRE AT KAMARAJAPURAM, PUDUKKOTTAI** during the year 2015"

I humbly request you to grant permission to conduct research study in urban community healh centre. I will be highly grateful to you for your favour.

Thanking you in anticipation

Yours Faithfully,

Place:
Date: A.Priyadharshini

C) **LETTER SEEKING EXPERT'S OPINION FOR CONTENT VALIDITY OF TOOL**

From

Ms.A.Priyadharshini,
M.Sc.(N) II year,
Karpaga Vinayaga college of Nursing,
Pudukkottai.

To:

Through,

The Principal
Karpaga Vinayaga College of Nursing
Pudukkottai.

Respected Madam

Sub: Requisition for content validity of tool.

…

I am A. Priyadharshini,doing M.Sc(Nursing) second year in Karpaga Vinayaga College of Nursing Pudukkottai, Under The Tamilnadu, Dr. M.G.R Medical university, Chennai. As a partial fulfillment of my M.Sc (N)Degree programme. I am conducting a research on "**A STUDY TO EVALUATE THE EFFECTIVENESS OF ROASTED FENUGREEK SEED POWDER ON BLOOD GLUCOSE AMONG CLIENTS WITH TYPE II DIABETES MELLITUS IN URBAN COMMUNITY HEALTH CENTRE, KAMARAJAPURAM, PUDUKKOTTAI".** A tool has been developed for the research study.

I am sending the tool for content validity and for your expert and valuable opinion.

I will be very thankful for your kind consideration. Kindly return it to the Undersigned.

Thanking you,

Yours Sincerely,

(A.PRIYADHARSHINI)

Encl:

1. Certificate of content validity,
2. Statement of the problem, objectives, hypothesis, research methodology.
3. Description of tool and tool for data collection.
4. Self addressed envelope.

D) **CERTIFICATE FOR VALIDITY**

This is to certify that the structured questionnaire schedule on "A quasi experimental study to evaluate the effectiveness of roasted fenugreek seed powder on blood glucose among clients with type II diabetes mellitus in urban community health care centre, Kamarajapuram, Pudukkottai", has been validated and found appropriate with mentioned suggestion.

Signature:

Name:

Designation:

Name of the college:

E) REQUISITION LETTER TO MEDICAL GUIDE

FROM

Ms. A. Priyadharshini,
M.Sc.(N) II year,
Karpaga Vinayaga College of Nursing,
Pudukkottai.

TO

Dr. V.C.SUBHASH GANDHI., M.B.B.S., Dip.(Diab),
Consultant Psychiatrist,
Dr. Muthulakshmi Memorial Head Quarters Hospital,
Pudukkottai.

THROUGH,

The Principal,
Karpaga Vinayaga College of Nursing
Pudukkottai.

Respected Sir,

Sub: **Requesting permission for the guidance to conduct the study, regarding.**

…

I am A.priyadharshini, II year M.Sc Nursing student of Karpaga Vinayaga College of Nursing , Pudukkottai. I would like to conduct a study as a part of partial fulfillment for the degree of masters in nursing. The statement of the problem **"A STUDY TO EVALUATE THE EFFECTIVENESS OF ROASTED FENUGREEK SEED POWDER ON BLOOD GLUCOSE AMONG CLIENTS WITH TYPE II DIABETES MELLITUS IN URBAN COMMUNITY HEALTH CENTRE,KAMARAJAPURAM PUDUKKOTTAI"**.

I humbly request you to give me guidance and suggestions for conducting my study.

Thanking you,

Yours Faithfully,

Place:

Date: A.PRIYADHARSHINI

LIST OF EXPERTS CONSULTED FOR THE CONTENT VALIDITY OF RESEARCH TOOL

LIST OF EXPERTS

1) **Ms.CHANDRAKALA M.Sc (N)., [Ph.D]**

   VICE PRINCIPAL

   SACRED HEART COLLEGE OF NURSING

   MADURAI

2) **Ms.PRISCILLA, M.Sc(N)., [Ph.D]**

   ASSOCIATE PROFESSER

   MATHA COLLEGE OF NURSING

   MANAMADURAI

3) **Mr.VIJAY RAJAKUMAR, M.Sc[N].,[Ph.D]**

   VICE PRINCIPAL

   CHITHIRAI COLLEGE OF NURSING

   MADURAI

4) **Ms.ELIZABETH GEAN ABRAHAM.,M.Sc[N].,[Ph.D]**

   PRINCIPAL

   P.S.G. COLLEGE OF NURSING

   COIMBATORE

5) **Ms.ANURADHA.,M.Sc[N]**

   ASSOCIATE PROFESSOR

   P.S.G. COLLEGE OF NURSING

   COIMBATORE

சமுதாய நலக்காரணிகள்

1. வயது (ஆண்டுகள்)
   அ. 31-40 வயது
   ஆ. 41-50 வயது
   இ. 50-60 வயது

2. பாலினம்
   அ. ஆண்
   ஆ. பெண்

3. திருமணம் நிலை
   அ. திருமணமானவர்
   ஆ. திருமணமாகாதவர்
   இ. விவாகரத்தானவர்
   ஈ. கணவர் அல்லது மனைவியை இழந்தவர்

4. மதம்
   அ. இந்து
   ஆ. கிறிஸ்துவம்
   இ. முஸ்லீம்

5. கல்வித்தகுதி
   அ. முறையற்ற கல்வி
   ஆ. உயர்நிலை கல்வி
   இ. மேல்நிலை கல்வி
   ஈ. பட்டதாரி

6. வேலை வாய்ப்பு
   அ. சுயதொழில்
   ஆ. அரசு பணியாளர்
   இ. தனியார் அலுவலகத்தில் பணிபுரிவர்
   ஈ. கூலி

7. மாதவருமானம்

அ. < 5000

ஆ. 5000 – 10000

இ. 10000 – 15000

ஈ. > 15,000 மேல்

8. நீரிழிவு நோய்க்கான உணவு முறையை பின்பற்றுகிறீர்களா?

அ. ஆம்

ஆ. இல்லை

9. தொடர் உடற்பயிற்சியை கடைப்பிடிக்கிறீர்களா?

அ. ஆம்

ஆ. இல்லை

10. நோய்வாய்ப்பட்ட காலம்?

அ. <2 வருடம்

ஆ. 2 – 5 வருடம்'

இ. >5 வருடம்

11. உங்கள் குடும்பத்தில் யாரேனும் நீரிழிவு நோயினால் பாதிக்கப்பட்டுள்ளனரா?

அ. ஆம்

ஆ. இல்லை

ஆம் எனில் எந்த உறவு முறை குறிப்பிடவும்

இரத்தத்தில் சர்க்கரையின் அளவை கண்டறிதல்

காரணிகள்	**வருத்த வெந்தயப்பொடியை உட்கொள்வதற்கு முன்**		**வருத்த வெந்தயபொடியை உட்கொள்வதற்கு பின்**	
அ. பரிசோதனைக்கு உட்படுத்தப்படும் குழு	சாப்பிடுவதற்கு முன் இரத்தத்தில் சர்க்கரையின் அளவு		வெந்தயபொடியை உட்கொண்டபிறகு இரத்தத்தில் சர்க்கரையின் அளவு (சாப்பிடுவதற்கு முன்)	
	தேதி	நோயாளியின் சர்க்கரை அளவு	தேதி	நோயாளியின் சர்க்கரை அளவு

காரணிகள்	**வருத்த வெந்தயப்பொடியை உட்கொள்வதற்கு முன்**		**வருத்த வெந்தயபொடியை உட்கொள்வதற்கு பின்**	
ஆ. பரிசோதனைக்கு உட்படுத்தப்படாத குழு	சாப்பிடுவதற்கு முன் இரத்தத்தில் சர்க்கரையின் அளவு		வெந்தயபொடியை உட்கொள்ளாமல் இரத்தத்தில் சர்க்கரையின் அளவு (சாப்பிடுவதற்கு முன்)	
	தேதி	நோயாளியின் சர்க்கரை அளவு	தேதி	நோயாளியின் சர்க்கரை அளவு